ORDER NO. HAD85042509A9

Service Manual

Turntable System

QUARTZ Direct Drive
Automatic Turntable

SL-QD3

Color

(S)...Silver Type
(K)...Black Type

Color	Areas
(S) (K)	[E] ..... Switzerland and Scandinavia.
(S) (K)	[EK]..... United Kingdom.
(S) (K)	[XL]..... Australia.
(S) (K)	[EG] ..... F.R. Germany.
(S) (K)	[EB]..... Belgium.
(S) (K)	[EH] ..... Holland.
(S) (K)	[EF]..... France.
(S) (K)	[Ei]..... Italy.
(S)	[EC] ..... Czechoslovakia.
(S) (K)	[XA]..... Southeast Asia, Oceania, Afirca, Middle Near East and Central South America.
(S) (K)	[XM]..... Central South America.
(S) (K)	[PA]..... Far East PX.
(S) (K)	[PE]..... European Military.
(S) (K)	[PC] ..... European Audio Club.

T4P is the standard mark for plug-in-connector type. Products carrying this mark are interchangeable and adaptable among each other.

Please use this manual together with the service manual for model No. SL–QD3 [M], Order No. HAD85032445C1.

SPECIFICATIONS

■ Turntable section

Type: Quartz direct drive
Automatic turntable

Features: Auto start
Auto return
Auto stop
Repeat Play
Manual play

Drive method: Direct drive

Motor: Brushless DC motor

Drive control method: Quartz-phase-locked control

Turntable platter: Aluminum die-cast
Diameter 31.2 cm

Turntable speeds: 33-1/3 rpm and 45 rpm

Wow and flutter: 0.012% WRMS*
0.025% WRMS (JIS C5521)
±0.035% peak
(IEC 98A Weighted)

*This rating refers to turntable assembly alone, excluding effects of record, cartridge or tonearm, but including platter. Measured by obtaining signal from built-in frequency generator of motor assembly.

Rumble: −56 dB (IEC 98A Unweighted)
−78 dB (IEC 98A Weighted)

■ Tonearm section

Type: Statically-balanced straight tonearm
Plug-in connector cartridge system

Effective length: 230 mm

Overhang: 15 mm

Tracking error angle: Within 2°32′ at the outer groove of 30 cm record
Within 0°32′ at the inner groove of 30 cm record

Effective mass: 13.5 g (including cartridge)

Stylus pressure adjustment range: 1.25±0.25 g

Applicable cartridge weight: 6 g

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Panasonic Tokyo Office
Matsushita Electric Trading Co., Ltd.
1-2, 1-chome, Shibakoen, Minato-ku, Tokyo 105, Japan

SL-QD3

■ Cartridge section

Type:	Moving magnet stereo cartridge
Magnetic circuit:	All laminated core
Frequency response:	10 Hz~40 kHz
Output voltage:	2.5 mV at 1 kHz 5 cm/s. zero to peak lateral velocity (7 mV at 1 kHz, 10 cm/s. zero to peak 45° velocity [DIN 45 500])
Channel separation:	More than 22dB at 1kHz
Channel balance:	Within 1.8dB at 1kHz
Recommended load impedance:	47 kΩ~100 kΩ
Compliance (dynamic):	12×10^{-6} cm/dyne at 100 Hz
Stylus pressure range:	1.25±0.25 g (12.5±2.5 mN)
Weight:	6 g (cartridge only)
Replacement stylus:	EPS-30ES

■ General

Power supply:	For United Kingdom and Australia: 240V, AC 50Hz For Continental Europe: 220V, AC 50Hz For others: ~110~127/ 220~240V, 50/60Hz
Power consumption:	6W
Dimensions: (W×H×D)	43×10×37.5 cm (Maximum height when dust cover is open. 43×37×41 cm)
Weight:	4.6kg

Specifications are subject to change without notice for further improvement.

TECHNISCHE DATEN

■ Plattenspieler

Typ:	Quarz-Direktantrieb Automatischer Plattenspieler Startautomotik Rückführautomatik Stopautomatik Wiederhol-Betrieb, Manueller Betrieb
Antrieb:	Direktantrieb
Motor:	Kollektorloser Gleichstrommotor
Antriebsregel-Methode:	Quarz-Steuerung (QPL)
Plattenteller:	Aluminium-Spritzguß Durchmesser 31,2 cm
Plattenteller-Drehzahlen:	33-1/3 und 45 U/min
Gleichlaufschwankungen:	0,012% WRMS* 0,025% WRMS (JIS C5521) ±0,035% Spitze (IEC 98A bewertet)

*Diese Nennleistung bezieht sich auf das Laufwerk-Bauteil allein, ausschließlich Einflüsse von Schallplatte, Tonabnehmer oder Tonarm, aber einschließlich Plattenteller. Gemessen anhand von Signalen vom eingebauten Frequenzgenerator des Motorbauteils.

Rumpel-Fremdspannungsabstand:	−56 dB (IEC 98A unbewertet)
Rumpel-Geräuschspannungsabstand:	−78 dB (IEC 98A bewertet)

■ Tonarm

Typ:	Statisch balancierter, gerader Tonarm Tonabnehmersystem vom Einsteck-Typ
Effektive Länge:	230 mm
Überhang:	15 mm
Spurfehlwinkel:	2°32′ bei der Einlaufrille einer 30 cm-Platte 0°32′ bei der Auslaufrille einer 30 cm-Platte
Effektive Masse:	13,5 g (einschließlich Tonabnehmer)
Auflagekraft-Einstellbereich:	1.25±0.25 g
Zulässiger Tonabnehmer-Gewichtbereich:	6 g

■ Tonabnehmer

Typ:	Stereo-Magnet-Tonabnehmer mit Einpunkt-Aufhängungssystem
Magnetkreis:	Ganzlamellenkern
Frequenzgang:	10 Hz bis 40 kHz
Ausgangsspannung:	2,5 mV bei 1 kHz 5 cm/s. Null-zu-Spitze, lateral [7 mV bei 1 kHz 10 cm/s. Null-zu-Spitze, 45° (DIN 45 500)]
Kanaltrennung:	22 dB bei 1 kHz
Kanalabweichung:	Innerhalb 1,8dB bei 1kHz
Empfohlene Endimpedanz:	47 kΩ~100 kΩ
Nachgiebigkeit (dynamisch):	12×10^{-6}cm/dyn bei 100 Hz
Auflagekraft-Einstellbereich:	1,25 ±0,25 g (12,5 ±2,5 mN)
Gewicht:	6 g (nur Tonabnehmer)
Ersatznadel:	EPS-30ES

■ Allgemeine Daten

Stromversorgung:	220 V, 50 Hz
Leistungsaufnahme:	6W
Abmessungen (B×H×T):	43×10×37,5 cm (Maximale Höhe bei geöffnetem Oberteil (staubabdeckung) 43×37×41 cm)
Gewicht:	4,6kg

Die technischen Daten Können infolgen von Verbesserungen ohne Ankündigung geändert werden.

CARACTERISTIQUES

■ Platine de lecture

Type: Entraînement direct à quartz
Platine automatique

Caractéristiques: Démarrage automatique
Retour automatique
Arrêt automatique
Audition répétée
Audition à commande manuelle

Système d'entraînement: Entraînement direct
Moteur: Moteur C.C. sans balai
Groupe de réglage: Réglage d'accrochage de phase par quartz

Plateau de lecture: En aluminium moulé sous pression
Diamètre 31,2 cm

Vitesses de rotation: 33-1/3 et 45 t/p.m

Pleurage et scintillement: 0,012% de valeur efficace*
0,025% de valeur efficace (JIC C5521)
±0,035% de crête (IEC 98A Pondéré)

*Ce régime nominal se rapporte à l'ensemble du tourne-disque seul, excluant les effets du disque, de la cellule pick-up ou du bras de lecture, mais comprenant le plateau. Mesuré par l'obtention d'un signal provenant du générateur de fréquences incorporé de l'ensemble du moteur.

Ronflement: −56 dB (IEC 98A Non pondéré)
−78 dB (IEC 98A Pondéré)

■ Bras de lecture

Type: Bras de lecture rectiligne statiquement équilibré.
Système de cellule de lecture à connecteur enfichable.

Longueur effective: 230 mm
Porte-à-faux: 15 mm
Angle d'erreur de piste: En deçà de 2°32' au sillon extérieur d'un disque de 30 cm
En deçà de 0°32' au sillon intérieur d'un disque de 30 cm

Masse réelle: 13,5 g (y compris la cellule pick-up)

Plage de réglage de la pression d'appui: 1.25±0.25 g

Gamme du poids des cellules pick-up utilisables: 6 g

■ Cellule pick-up

Type: Cellule pick-up stéréo à aimant mobile

Circuit magnétique: Noyau entièrement feuilleté

Réponse en fréquence: 10 Hz à 40 kHz

Tension de sortie: 2,5 mV à 1kHz; 5 cm/s., zéro à vitesse latérale de crête
(7 mV à 1 kHz
10 cm/s., zéro à vitesse 45° de crête [DIN 45 500])

Séparation des canaux: Plus de 22dB à 1kHz

Equilibrage des canaux: En deçà de 1,8dB à 1kHz

Impédance de charge recommandée: 47 kΩ~100 kΩ

Elasticité (dynamique): 12×10^{-6} cm/dyne à 100 Hz

Plage de la force verticale d'appui: 1,25±0,25 g (12,5±2,5 mN)

Poids: 6 g (cellule seule)

Pointe de lecture de remplacement: EPS-30ES

■ Généralités

Alimentation: Alternatif 220V, 50Hz

Consommation: 6W

Dimensions: (L×H×P) 43×10×37,5 cm
Hauteur maximum lorsque le couvercle protège-poussière est ouvert. 43×37×41 cm

Poids: 4,6kg

Sujet à changement sans prearis.

ESPECIFICACIONES

■ Sección del plato giratorio

Tipo: Accionamiento directo por cuarzo
Plato giratorio automático

Ventajas: Arranque automático
Retorno automático
Parada automática
Ejecución repetida
Ejecución manual

Método de accionamiento: Accionamiento directo

Motor: Motor de corriente continua sin escobillas

Método de control de accionamiento: Control enclavado de fase de cuarzo

Platillo del plato giratorio: Aluminio fundido
Diámetro 31,2 cm

Velocidades del plato giratorio: 33-1/3 y 45 rpm

Ululaciones y trémolo: 0,012% WRMS*
0,025% WRMS (JIS C5521)
±0,035% cresta (IEC 98A Ponderado)

*Estas características se refieren únicamente al conjunto del plato giratorio, con exclusión de los efectos provenientes del disco, cartucho o del brazo sonoro, incluyendo, empero, el platillo. La medida fue tomada por medio de la señal obtenida del generador de frecuencia incorporado del conjunto del motor.

Ruido de rodadura: −56 dB (IEC 98A No ponderado)
−78 dB (IEC 98A Ponderado)

■ Sección del brazo sonoro

Tipo Brazo sonoro recto equilibrado estáticamente
Sistema de cartucho con conector enchufable

Longitud efectiva: 230 mm

Proyección: 15 mm

Angulo de error de seguimiento: Inferior a 2°32′ en el surco exterior de un disco de 30 cm
Inferior a 0°32′ en el surco interior de un disco de 30 cm

Masa efectiva: 13,5 g (incluyendo el cartucho)

Radio de ajuste de la presión de la aguja: 1.25±0.25 g

Radio de peso de cartucho utilizable: 6 g

■ Sección del cartucho

Tipo: Cartucho estereofónico de imán móvil

Circuito magnético: Núcleo totalmente laminado

Respuesta de frecuencia: 10 Hz a 40 kHz

Voltaje de salida: 2,5 mV a 1 kHz
Con velocidad lateral de cero a cresta de 5 cm/s
[7 mV a 1 kHz Velocidad de 45° de cero a cresta de 10 cm/s (DIN 45 500)]

Separación de canales: Más de 22dB a 1kHz

Equilibrio de canales: Sin exceder 1,8dB a 1kHz

Impedancia de carga recomendada: 47 kΩ a 100 kΩ

Elasticidad (dinámica): 12×10^{-6} cm/dina a 100 Hz

Radio de presión de la aguja: 1,25±0,25 g (12,5±2,5 mN)

Peso: 6 g (cartucho sólo)

Aguja de recambio: EPS-30ES

■ En general

Alimentación de corriente: ~110~127/220~240V, 50/60Hz

Consumo de corriente: 6W

Dimensiones: (Ancho×Alto×Prof.) 43×10×37,5cm
Altura máxima cuando la tapa contra el polvo está abierta. 43×37×41cm

Peso: 4,6kg

Estas especificaciones están sujetas a cualquier cambio sin previo eviso.

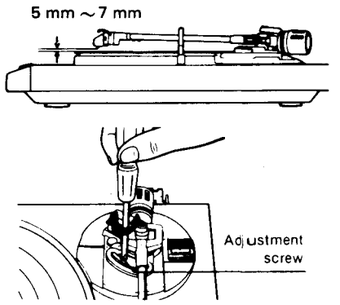
■ MEASUREMENTS AND ADJUSTMENT — English

1. Arm-lift height

The arm-lift height (distance between the stylus tip and the record surface when the cueing control is at the " ▼ " position) has been adjusted at the factory to aproximately 5 to 7 mm.
If the clearance is too narrow or too wide, turn the adjustment screw clockwise or counterclockwise.

Clockwise rotation
– distance between the record and stylus tip is decreased.

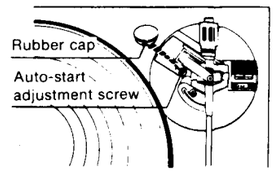
Counterclockwise rotation
– distance between the record and stylus tip is increased.



2. Adjustment of automatic start position

If the stylus does not land in the lead-in groove, adjust as follows.
1. Clamp the tonearm to the arm rest.
2. Remove the rubber cap.
3. Turn the screw with a screwdriver, clockwise or counterclockwise as necessary.

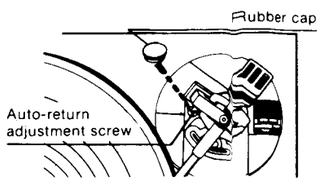
If the stylus tip sets down too far in the recorded groove.
—turn counterclockwise.
If the stylus tip sets down outside of the record.
—turn clockwise.
Adjust so the stylus tip lands 1 ~ 2 mm in from the edge of the record.



3. Automatic return position

(Remove the rubber cap.)
1. Put the stylus protector on the cartridge.
2. Move the tonearm toward the center of the record.
   The auto-return adjustment screw will appear.

If the tonearm tends to return to the arm reset before the play has finished.
– turn counterclockwise.
If the tonearm fails to return after the final groove.
– turn clockwise.



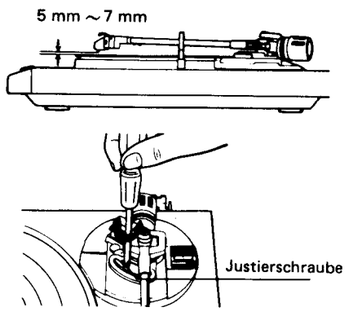
■ MESSUNGEN UND JUSTIERUNGEN — Deutsch

1. Justierung der Tonamlifthöhe

Die Tonarmilifthöhe, d.h. der Abstand zwischen Nadelspitze und Schallplattenoberfläche bei Liftsteuerungs-Position " ▼ ", wurde werkseitig auf ca. 5 ~ 7 mm eingstellt.
Falls der Abstand zu groß oder zu klein ist (z.B. wegen unterschiedlicher Tonabnehmergröße), drehen Sie die Justierschraube im Uhrzeigersinn oder entgegen dem Uhrzeigersinn.

Drehung im Uhrzeigersinn
– Der Abstand zwischen der Platte und der Nadelspitze wird kleiner.

Drehung entgegen dem Uhrzeigersinn
– Der Abstand zwischen der Platte und der Nadelspitze wird größer.



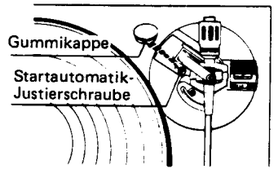
2. Justierung des Aufsetzpunktes der Automatik

Wenn der Tonarm in der Nähe der Plattenmitte ist, so ist die Auto-Rückkehr-Justierschraube sichtbar.

Wenn die Abtastnadel nicht in der Einlaufrille aufsetzt, justieren Sie wie folgt.

1. Befestigen Sie den Tonarm mit der Arretierklammer auf der Tonarmablage.
2. Nehmen Sie die Gummikappe von der Auto-Start-Positions-Justierschraube ab.
3. Drehen Sie die Justierschraube im Uhrzeigersinn oder entgegen dem Uhrzeigersinn, wie erforderlich.

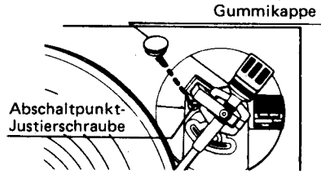
Falls der Aufsetzpunkt im Wiedergabeteil der Schallplatte liegt.
– Entgegen dem Uhrzeigersinn drehen.
Falls der Aufsetzpunkt außerhalb der Platte liegt.
– Im Uhrzeigersinn drehen.
Justieren Sie so, daß die Nadelspitze 1 – 2 mm vom Rand entfent auf der Platte aufsetzt.



3. Justierund des Abschaltpunktes der Automatik

(Die Gummikappe abnehmen)
1. Setzen Sie den Nadelschutz auf den Tonabnehmer auf.
2. Führen Sie den Tonarm gegen die Plattenmitte.
   Die Justierschraube für den Abschaltpunkt der Automatik wird dann sichtbar.

Falls der Tonarm zu früh zurückkehrt.
– Entgegen dem Uhrzeigersinn drehen.
Falls der Tonarm nach Erreichen der Auslaufrille nicht zurückkehrt.
– Im Uhrzeigersinn drehen.



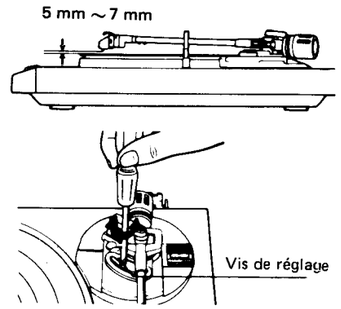
■ MESURAGES ET RÉGLAGES — Français

1. Mise au point de la hauteur de l'élévateur du bras

La hauteur de l'élévateur du bras (distance entre l'extrémité de la pointe de lecture et la surface du disque, lorsque la commande de pose et de relevage est à la position " ▼ ") à été réglée en usine sur approximativement 5 à 7 mm.
Si l'écartement est trop étroit ou trop large, tourner la vis de réglage dans le sens des aiguilles d'une montre ou dans le sens contraire.

Rotation dans le sens des aiguilles d'une montre.
– La distance entre la surface du disque et l'extrémité de la pointe de lecture diminue.

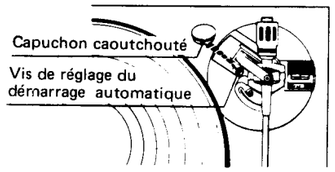
Rotation dans le sens contraire des aiguilles d'une montre.
– La distance entre la surface du disque et l'extrémité de la pointe de lecture augmente.



2. Mise au point de la position de démarrage automatique

Si la pointe de lecture ne repose pas dans le sillon d'entrée, ajuster de la manière suivante.
1. Bloquer le bras de lecture sur le support du bras.
2. Retirer le capuchon en caoutchouc.
3. Avec un tournevis, tourner la vis de réglage dans le sens des aiguilles d'une montre ou dans le sens inverse selon la nécessité.

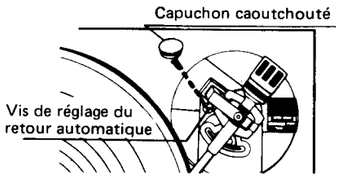
Si la tête de la pointe de lecture se dépose trop loin du sillon enregistré,
– tourner dans le sens contraire des aiguilles d'ue montre.
Si la tête de la pointe de lecture se dépose en dehors du disque,
– tourner dans le sens des aiguilles d'une montre.
Ajuster de façon à ce que l'extrémité de la pointe de lecture atterrisse à 1 – 2 mm à partir du bord du disque.



3. Mise au point de la position de retour automatique

(Retirer le tapis du plateau de lecture.)
1. Placer le capot protecteur de la pointe de lecture sur la cellule pick-up.
2. Déplacer le bras de lecture vers le centre du disque.
   Alors, la vis de réglage du retour automatique apparaîtra.

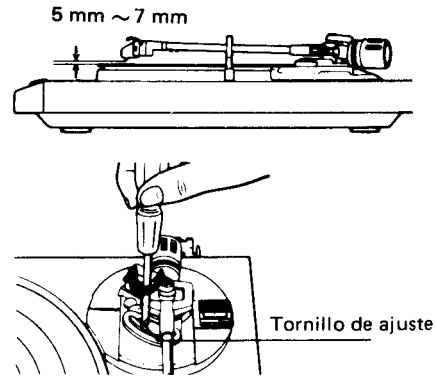
Si le bras de lecture tend à revenir vers le support du bras avant que l'audition ne soit terminée.
– tourner dans le sens contraire des aiguilles d'une montre.
Si le bras de lecture ne peut revenir en arrière après le dernier sillon.
– tourner dans le sens des aiguilles d'une montre.



■ MEDICIONES Y AJUSTE — Español

1. Ajuste de la altura de elevación del brazo

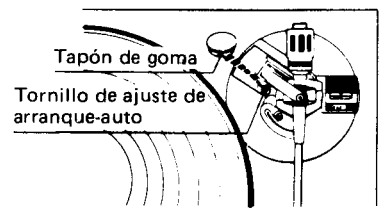
La altura de elevación del brazo (o sea, la distancia entre la punta de la aguja y la superficie del disco cuando el control de colocación esté en la posición " ▼ ") has sido regulada en la fábrica aproximadamente entre 5 y 7 mm.
En caso que la distancia fuese demasiado abundante o demasiado escasa, girar el tornillo de ajuste hacia la derecha o hacia la izquierda.
Rotación hacia la derecha
– reduce la distancia entre el disco y la punta de la aguja.
Rotación hacia la izquierda
– aumenta la distancia entre el disco y la punta de la aguja.



2. Ajuste de la posición para el arranaue automático

En caso que la aguja no se depositara en el surco de comienzo, regular de la manera que sigue.
1. Sujetar el brazo sonoro al apoyo del mismo con la grapa.
2. Quitar la tapita de goma.
3. Girar el tornillito de ajuste hacia la derecha o hacia la izquierda usando un destornillador, según sea necesario.

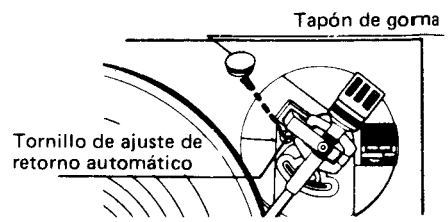
En caso que la punta de la aguja se deposita muy dentro del surco grabado:
– Girar hacia la izquierda.
En caso que la punta de la aguja se deposita fuera del disco:
– Girar hacia la derecha.
Regular de manera tel que la punta de la aguja se deposite a uno o dos milímetros del borde del disco.



3. Ajuste de la posición para retorno automatico

(Quitar la almohadilla del plato giratorio.)
1. Colocar la protección de la aguja en el cartucho.
2. Mover el brazo sonoro hacia el centro del disco.
   Con ello, aparecerá el tonillo de ajuste del retorno automático.

Cuando el brazo sonoro tienda a volver a su apoyo antes de terminar la ejecución.
– Girar hacia la izquierda.
En caso que el brazo sonoro no vuelva después de haber tocado el último surco del disco.
– Girar hacia la derecha.



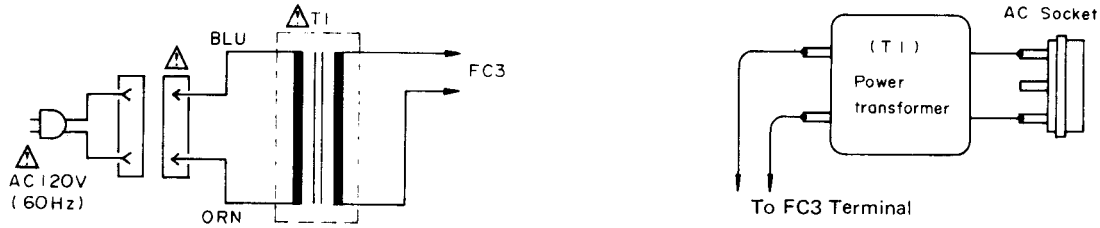
■ SCHEMATIC DIAGRAM AND PRINTED CIRCUIT BOARD

Important safety notice:

Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components use only manufacturer's specified parts.

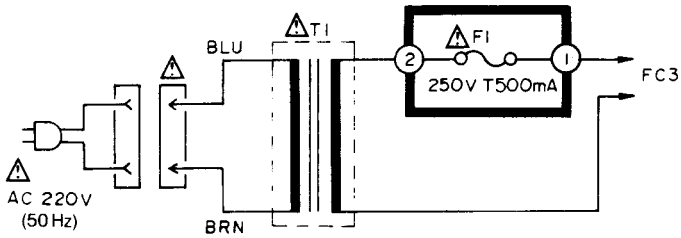
- **Change in power source circuit**

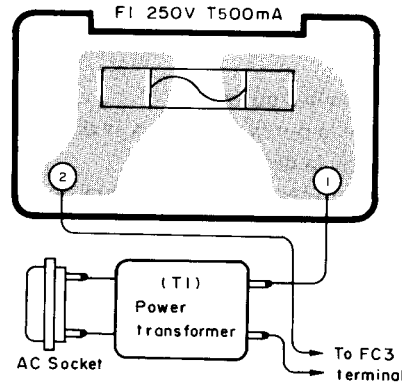
Product for U.S.A. ([M] area)



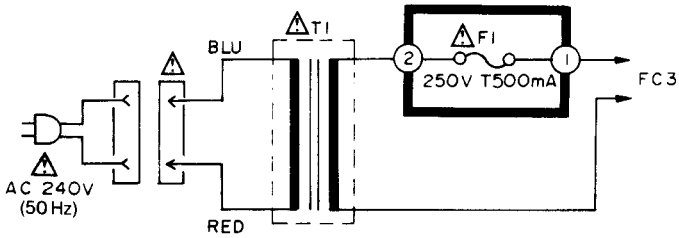
Change

Product for Continental Europe ([E], [EG], [EB], [EH], [EF], [Ei] and [EC] areas.)

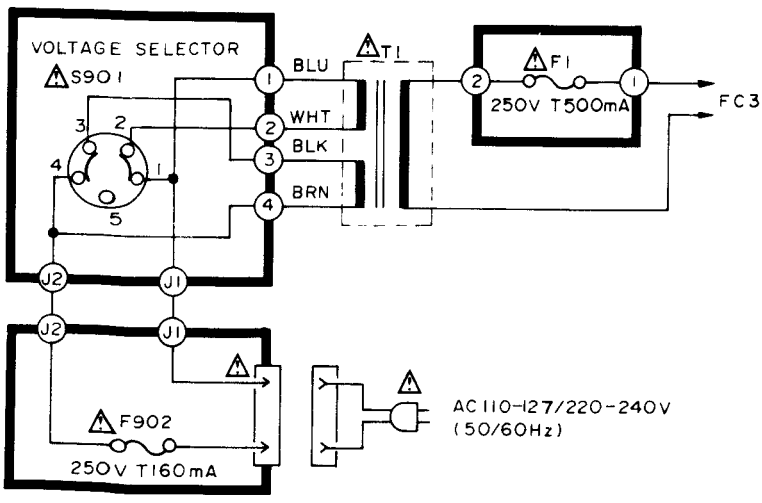


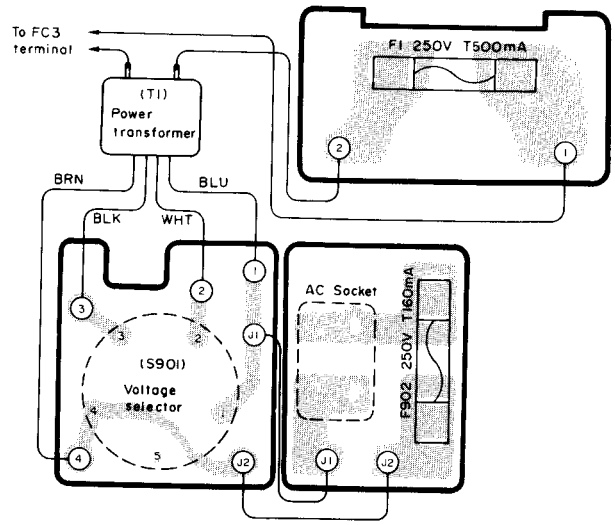


Product for United Kingdom and Australia ([EK] and [XL] areas)



Product for Southeast Asia, Occania, Africa, Middle Near East, Central South America, Far East PX, European Military and European Audio Club. ([XA], [XM], [PA], [PE], and [PC] areas.)





■ CHANGE IN REPLACEMENT PARTS LIST

Notes:

1. Mentioned in this parts list are only those changed in Model No. SL-QD3 for destination [M] area.
2. Important safety notice:
   Components identified by ⚠ mark have special characteristics important for safety.
   When replacing any of these components, use only manufacturer's specified parts.
3. Ⓚ -marked parts are used for black only, while ○-marked parts are for silver type only.
4. Part other than Ⓚ -and ○-marked are used for both black and silver type.
5. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Ref. No.	Change of Part SL-QD3 [M] ➡ SL-QD3/(K)		Area & Color	Part Name & Description
SWITCH				
S901	Addition	SFDSHXW225-3	[XA,XM,PA,PE,PC] only	Voltage Selector ⚠
POWER TRANSFORMERS				
T1	SLT48DTL3A	SLT48DTE13E	[EK, XL]	Power Source ⚠
		SLT57DT7E	[XA,XM,PA,PE,PC]	
		SLT48DT10E	[Other]	
FUSES				
F1	Addition	XBA2C05TR0		250V, T500mA ⚠
F902	Addition	XBA2C016TR0	[XA,XM,PA,PE,PC] only	250V, T160mA ⚠
CABINET and CHASSIS PARTS				
10	SFGCC05N02	SFGCC05X01	[XA,XM,PA,PE,PC]	Rubber Cushion
		SFGCC05N02	[Other]	
12	SFDJHSC0491	SFDJHSC0491	[XL]	AC Socket ⚠
		SFDJHSC04912	[XA,XM,PA,PE,PC]	
		SFDJHSC0516	[Other]	
13	SFACQD3N01E	SFACQD3N01E	○	Cabinet
		SFACQD3N21E	Ⓚ	
13-1	SFKBBD2N01	SFKBBD2N01	○	Badge
		SFKBBD2N21	Ⓚ	
14	SFKKQD3N01	SFKKQD3N01	○	Ornament Plate
		SFKKQD3N21	Ⓚ	
37	SFNNQD3M01	SFNNQD3S01	[E, EC]	Name Plate
		SFNNQD3G01	[EK, XL]	
		SFNNQD3R01	[EG]	
		SFNNQD3X01	[XA]	
		SFNNQD3X02	[XM]	
		SFNNQD3P01	[PA, PE]	
		SFNNQD3P02	[PC]	
		SFNNQD3Q01	[Other]	

Ref. No.	Change of Part SL-QD3 [M] ➡ SL-QD3/(K)		Area & Color	Part Name & Description
TONEARM PARTS				
41	SFPAMQD201A	SFPAMQD201A	○	Tonearm
		SFPAMQD202A	Ⓚ	
43	SFGK170-01	SFGK170-01	○	Rubber Cup
		SFGK171F01	Ⓚ	
54	Addition	EPC-P33	[PA, PE, PC]	★ Cartridge
		EPC-P30X	[Other]	
55	Addition	EPS-33ES	[PA, PE, PC]	★ Stylus
		EPS-30ES	[Other]	
56	Addition	SFCNC05101	[PA, PE, PC]	Cover, Stylus
		SFCNC03301	[Other]	
ACCESSORIES				
A1	SFNUQD3M01	SFNUQD3G01	[EK]	Instruction Book
		SFNUQD3R01	[EG]	
		SFNUQD3F01	[EF]	
		SFNUQD3I01	[Ei]	
		SFNUQD3X01	[XL, XA, XM]	
		SFNUQD3P01	[PA, PE, PC]	
		SFNUQD3S01	[Other]	
A4	SFDAC05M01	SFDAC05G02	[EK]	AC Cord ⚠
		SFDAC05L01	[XL]	
		SFDAC05X02	[XA]	
		SFDAC05M01	[XM]	
		SFDAC05N01	[PA, PE, PC]	
		SFDAC05E02	[Other]	
A6	Addition	SFDKI19118	[XA, XM] only	Plug ⚠
A7	Addition	QJP0603S	[PA, PE, PC] only	Adaptor ⚠
PACKING PARTS				
P1	SFHPQD3M01	SFHPQD3C01	[EF] ○	Carton Box
		SFHPQDM01	[Other] ○	
		SFHPQD3F21	[EF] Ⓚ	
		SFHPQD3M21	[Other] Ⓚ	

■ REPLACEMENT PARTS LIST

Notes:

1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. Important safety notice:
   Components identified by ⚠ mark have special characteristics important for safety.
   When replacing any of these components, use only manufacturer's specified parts.
3. Ⓚ -marked parts are used for black only, while ○-marked parts are for silver type only.
4. Part other than Ⓚ -and ○-marked are used for both black and silver type.
5. Bracketed indications in Ref. No. columns specify the area.
   Parts without these indications can be used for all areas.
6. The " S " mark is service standard parts and may differ from production parts.
7. The parenthesized numbers in the column of description stand for the quantity per set.

Color	Areas
(S) (K)	[E]..... Switzerland and Scandinavia.
(S) (K)	[EK]..... United Kingdom.
(S) (K)	[XL]..... Australia.
(S) (K)	[EG]..... F.R. Germany.
(S) (K)	[EB]..... Belgium.
(S) (K)	[EH]..... Holland.
(S) (K)	[EF]..... France.
(S) (K)	[Ei]..... Italy.
(S)	[EC]..... Czechoslovakia.
(S) (K)	[XA]..... Southeast Asia, Oceania, Afirca, Middle Near East and Central South America.
(S) (K)	[XM]..... Central South America.
(S) (K)	[PA]..... Far East PX.
(S) (K)	[PE]..... European Military.
(S) (K)	[PC]..... European Audio Club.

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1	AN78M12	Regulator
IC101	AN6638	Drive
IC201	AN6683N	Control
TRANSISTORS		
Q11, 12	2SD636	Strobe Drive
DIODES		
D1~4 ⚠	SVD1SR35200V	Rectifier
D11	SVDBR5505SB	Strobe
D12~15	SVDAY5525S	Quarts Indication
D16	MA4075	Zener, 7.5V
SWITCHES		
S1	SFDSD72R01	Start/Stop
S2	SFDSHSW0949	Speed Selector
S901 [XA, XM, PA, PE, PC] only ⚠	SFDSHXW225-3	Voltage Selector
HALL ELEMENTS		
H101, 102	0H-002	Turntable Position Detector

Ref. No.	Part No.	Description
POWER TRANSFORMERS		
T1 [EK, XL] ⚠	SLT48DTL13E	Power Source
T1 [XA, XM, PA, PE, PC] ⚠	SLT57DT7E	Power Source
T1 [other] ⚠	SLT48DT10E	Power Source
CRYSTAL		
X201	SVQSH41TR	4.193MHz
FUSES		
F1 ⚠	XBA2C05TR0	250V, T500mA
F902 [XA, XM, PA, PE, PC] only ⚠	XBA2C016TR0	250V, T800mA

Ref. No.	Part No.	Description
RESISTORS		
R11	ERDS2TJ332	Carbon, 1/4W, 3.3KΩ, ±5%
R12	ERDS2TJ820	Carbon, 1/4W, 82Ω, ±5%
R13, 14	ERDS2TJ151	Carbon, 1/4W, 150Ω, ±5%
R15	ERDS2TJ471	Carbon, 1/4W, 470Ω, ±5%

Ref. No.	Part No.	Description
RESISTORS		
R16	ERDS2TJ221	Carbon, 1/4W, 220Ω, ±5%
R17	ERDS2TJ471	Carbon, 1/4W, 470Ω, ±5%
R18	ERDS2TJ390	Carbon, 1/4W, 39Ω, ±5%
R19	ERDS2TJ332	Carbon, 1/4W, 3.3KΩ, ±5%
R103	ERD10TLJ104U	Chip Carbon, 1/8W, 100KΩ, ±5%
R104	ERX1ANJ1R8	Metal Film, 1W, 1.8Ω, ±5%
R105	ERD10TLJ150U	Chip Carbon, 1/8W, 15Ω, ±5%
R201	ERD10TLJ273U	Chip Carbon, 1/8W, 27KΩ, ±5%
R202	ERD10TLJ394U	Chip Carbon, 1/8W, 390KΩ, ±5%
R203	ERD10TLJ680U	Chip Carbon 1/8W, 68Ω, ±5%
R204	ERD10TLJ151U	Chip Carbon, 1/8W, 150Ω, ±5%
R205	ERD10TLJ223U	Chip Carbon, 1/8W, 22KΩ, ±5%
R207	ERD10TLJ102U	Chip Carbon, 1/8W, 1KΩ, ±5%
R208	ERD10TLJ680U	Chip Carbon 1/8W, 68Ω, ±5%

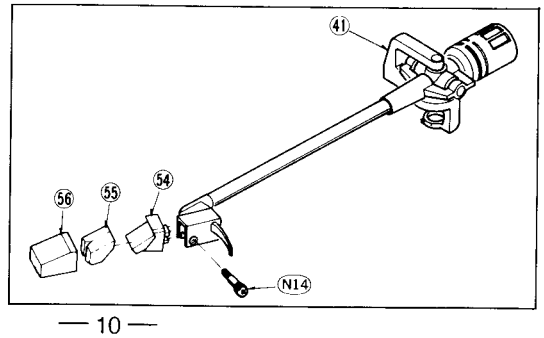
Ref. No.	Part No.	Description
CAPACITORS		
C1~3 ⚠	ECQG1223KZ	Polyester, 100V, 0.022μF, ±10%
C4	ECEB1VU102	Electrolytic, 35V, 1000μF
C5, 6	ECFR1H104ZF	Ceramic, 50V, 0.1μF, +80 −20%
C11	ECEA1HU2R2B	Electrolytic, 50V, 2.2μF
C101	ECEA1CS330	Electrolytic, 16V, 33μF
C102	ECEA1HSR22B	Electrolytic, 50V, 0.22μF
C103	ECQV05274JZ	Polyester, 50V, 0.27μF, ±5%
C105, 106 ⚠	ECEA1AN470S	Non Polar Eiectrolytic, 10V, 47μF
C107	ECEA1HS010B	Electrolytic, 50V, 1μF
C201	ECEA0JS470B	Electrolytic, 6.3V, 47μF
C202	ECEA1HSR22B	Electrolytic, 50V, 0.22μF
C203	ECQM1H683KV	Polyester, 50V, 0.068μF, ±10%
C204	ECUV1H121JCM	Chip Ceramic, 50V, 120PF, ±5%
C205	ECUV1H330JCM	Chip Ceramic, 50V, 33PF, ±5%
C206	ECUV1H121JCM	Chip Ceramic, 50V, 120PF, ±5%
C207	ECEA0JS470B	Electrolytic, 6.3V, 47μF
C208	ECEA1AS221B	Electrolytic, 10V, 220μF
CABINET and CHASSIS PARTS		
1	SFADZ15R01E	Dust Cover (1)
1-1	SFGZD04N01	Rubber Cushion (2)
2	SFTGBD3N01	Turntable Mat (1)
3	SFUMQ34N01E	Base, Disc Size Sensor (1)
4	SFUZD33−01E	Latch, Disc Size Sensor (2)
6	SFTEQD3N01	Turntable Platter (1)
7	SFTMC07−01E	Magnet (1)
8	SFMGQ34N01	Cover, Stator Coil (1)
9	SFMZQ63M53A	Stator Flame Ass'y (1)
10 [XA, XM, PA, PE, PC]	SFGCC05X01	Rubber Cushion (2)
10 [other]	SFGCC05N02	Rubber Cushion (2)
11	SFGZC05N03	Rubber Cushion (1)
12 [XL] ⚠	SFDJHSC0491	AC Socket (1)
12 [XA, ⚠ XM, PA, PE, PC]	SFDJHSC04912	AC Socket (1)
12 ⚠ [other]	SFDJHSC0516	AC Socket (1)
13 ○	SFACQD3N01E	Cabinet (1)
13 Ⓚ	SFACQD3N21E	Cabinet (1)
13-1 ○	SFKBBD2N01	Badge (1)
13-1 Ⓚ	SFKBBD2N21	Badge (1)
14 ○	SFKKQD3N01	Ornament Plate (1)
14 Ⓚ	SFKKQD3N21	Ornament Plate (1)
15	SFKTBD2N03	Knob, Speed Selector (1)
16	SFUMQD3N01	Lever, Knob (1)
17	SFUMBD2N06	Holder (1)
18	SFKTBD2N01	Knob, Start, Stop (1)
19	SFUZB63M01	Rod, Start, Stop (1)
20	SFUMBD3N01	Base, Start, Knob (1)
21	SFDJBD2N01	Terminal Plate, Phono Output (1)
23	SFUMBD2N03	Lever, Cueing (1)
24	SFUPB63M01	Lever, Repeat (1)
25	SFKTBD2N02	Knob, Cueing (1)
26	SFQPZ15R02	Spring (2)
27	SFYB−5−32	Ball (2)
28	SFKTBD2N02	Knob, Repeat (1)
29	SFUMBD3N02	Guide, Cueing Knob (1)
30	SFUMBD2N02	Guide, Repeat Knob (1)
31	SFUMC13N03	Prism (1)
32	SFAUBD2N01	Bottom, Cover (1)
33	SFQCQD3N01	Spring, Insulator (4)
34	SFGABD2N01	Insulator (4)
35	SFATZ15R01A	Hinge (2)
37 [E, EC]	SFNNQD3S01	Name Plate (1)
37 [EG]	SFNNQD3R01	Name Plate (1)
37 [EK, XL]	SFNNQD3G01	Name Plate (1)
37 [XA]	SFNNQD3X01	Name Plate (1)
37 [XM]	SFNNQD3X02	Name Plate (1)
37 [PA, PE]	SFNNQD3P01	Name Plate (1)
37 [PC]	SFNNQD3P02	Name Plate (1)
37 [other]	SFNNQD3Q01	Name Plate (1)
38	SFUMBD2N07	Storobe (1)
39	SFQHZ15R01	Spring (1)

Ref. No.	Part No.	Description
TONEARM PARTS		
41 ○	SFPAMQD201A	Tonearm (1)
41 Ⓚ	SFPAMQD202A	Tonearm (1)
42	SFKUMA1N01E	Arm Rest (1)
43 ○	SFGK170−01	Rubber Cap (1)
43 Ⓚ	SFGK171F01	Rubber Cap (1)
44	SFKKBD2N02	Plate, Canceller (1)
45	SFXJBD2N51	Lift Shaft (1)
46	SFUMBD2N51	Lift Arm (1)
47	SFUPBD3N51E	Arm Base (1)
48	SFQAZ15R53	Spring, Lift Arm (1)
49	SFGZZ15R02	Holder (1)
50	SFUPB63M52E	Fixing Plate (1)
51	SFQHB63M57	Spring, Canceller (1)
52	SFQHB63M56	Spring (1)
53	SFUMZ15R57	Spring Pin (1)
54 [PA, PE, PC]	EPC−P33	★ Cartridge (1)
54 [other]	EPC−P30	★ Cartridge (1)
55 [PA, PE, PC]	EPC−33ES	★ Stylus (1)
55 [other]	EPC−30ES	★ Stylus (1)
56 [PA, PE, PC]	SFCNC05101	Cover Stylus (1)
56 [other]	SFCNC03301	Cover Stylus (1)
AUTOMATIC MECHANISM PARTS		
61	SFUKB63M52E	Mechanism Plate (1)
62	SFUBB63M51E	Drive Plate (1)
62-1	SFUMB63M52	Repeat Plate (1)
62-2	SFQPB63M51	Spring (1)
62-3	SFUMB63M51	Plate (1)
63	SFUMB63M71E	Lever Switch Ass'y (1)
63-1	SFQHQD3N01	Spring (1)
64	SFUMB63M53E	Cut Lever Ass'y (1)
64-1	SFQHB63M51	Spring (1)
65	SFUMB63M54	Lever, Drive Operation (1)
66	SFUGB63M51E	Main Gear Ass'y (1)
67	SFUMB63M65	Control Plate (1)
68	SFUMB63M64E	Plate (B) Ass'y Index (1)
69	SFUMB63M63	Plate (A), Index (1)
70	SFQPB63M53	Spring, Index Sub Plate (1)
71	SFUMB63M62	Sub Plate, Index (1)
72	SFUMB63M59	Lever, Cueing (1)
73	SFUMB63M60	Cam, Cueing (1)
74	SFQPB63M52	Spring, Cueing Cam (1)
75	SFQPB63M54	Spring, Cueing Cam (1)
76	SFUMB63M61	Lever, Brake (1)
77	SFQSB63M52	Spring, Brake (1)
78	SFUZB63M52	Felt, Brake Lever (1)
79	SFQHB63M55	Spring, Cueing Cam (1)
80	SFUMB63M58	Lever, Repeat (1)
81	SFQHB63M54	Spring, Repeat Lever (1)
82	SFUMQ63M51E	Record Size Detector Ass'y (1)
82-1	SFQHB63M53	Spring, Record Size Detector Ass'y (1)
83	SFUMZ15R56	Pin (7)
84	SFQSB63M51	Rod (1)
SCREWS and WASHERS		
N1	XTN3+6J	Screw, ⊕3×6 (3)
N2	XTV3+6J	Screw, ⊕3×6 (4)
N3	XTW3+14QFYR	Screw, ⊕3×14 (4)
N4	XTV3+8G	Screw, ⊕3×8 (10)
N5	SFXWC06N02	Washer (1)
N6	SFXGQ06N01	Screw (4)
N7	XWC3B	Washer, φ3 (1)

Ref. No.	Part No.	Description
SCREWS and WASHERS		
N8	XTV3+10G	Screw, ⊕3×10 (6)
N9	XTV3+30J	Screw, ⊕3×30 (1)
N10	SFXGQ34N02	Screw (1)
N12	SFXWZ15R51	Washer (1)
N13	XYN3+F12	Screw, ⊕3×12 (2)
N14	SFPEV0Q601	Screw, Cartridge (1)
N16	SFXWZ15R51	Washer (9)
N20	SFXWB63M52	Washer (1)
N21	SFXWB63M53	Washer (1)
N22	XTV3+20J	Screw, ⊕3×20 (1)
ACCESSORIES		
A1 [EK]	SFNUQD3G01	Instruction Book (1)
A1 [EG]	SFNUQD3R01	Instruction Book (1)
A1 [EF]	SFNUQD3F01	Instruction Book (1)
A1 [Ei]	SFNUQD3I01	Instruction Book (1)
A1 [XL, XA, XM]	SFNUQD3X01	Instruction Book (1)
A1 [PA, PE, PC]	SFNUQD3P01	Instruction Book (1)
A1 [other]	SFNUQD3S01	Instruction Book (1)
A2	SFDHBD2N01	Phono Cord (1)
A3	SFDLJ02N11E	Ground Wire (1)
A4 ⚠ [EK]	SFDAC05G02	AC Cord (1)
A4 ⚠ [XL]	SFDAC05L01	AC Cord (1)
A4 ⚠ [XA]	SFDAC05X02	AC Cord (1)
A4 ⚠ [XM]	SFDAC05M01	AC Cord (1)
A4 [PA, ⚠ PE, PC]	SFDAC05N01	AC Cord (1)
A4 ⚠ [other]	SFDAC05E02	AC Cord (1)
A5	SFWE212−01	45 Adaptor (1)
A6 ⚠ [XA, XM] only	SFDKI19118	Plug (1)
A7 ⚠ [PA, PE, PC] only	QJP0603S	Adaptor (1)
PACKING PARTS		
P1 ○ [EF] only	SFHPQD3C01	Carton Box (1)
P1 ○ [other]	SFHPQD3M01	Carton Box (1)
P1 Ⓚ [EF] only	SFHPQD3F21	Carton Box (1)
P1 Ⓚ [other]	SFHPQD3M21	Carton Box (1)
P2	SFHHBD3N01	Pad (Left) (1)
P3	SFHHBD3N02	Pad (Right) (1)
P4	SFHZBD2N01	Clamper, Tonearm Weight (1)
P5	SFHZZ15R02	Clamper, Cord (1)
P6	SFHZB63M01	Clamper, Tonearm (1)
P7	SFHKB63M01	Clamper, Turntable Platter (2)
P8	SFYP75A41	Sheet (1)
P9	SFYH60X60	Polyethylene Bag, Unit (1)
P10	SFYH52X50	Polyethylene Bag, Dust Cover (1)
P11	SFYH17X16	Polyethylene Bag, Cord (1)
P12	SFYF32A35	Polyethylene Bag, Turntable Mat (1)
P13	SFHDBD2N01	Pad, Turntable Mat (1)

■ EXPLODED VIEW

- **Addition of cartridge, stylus and stylus cover**



Printed in Japan
850406000 Ⓗ AM/HY

ORDER NO. HAD85032445C1
A2

Service Manual

Turntable System

SL-QD3

Color

(S)...Silver Type

Area

[M] .....U.S.A.
[MC] ...Canada.

T4P is the standard mark for the "P–mount" plug-in-connector system. Products carrying this mark are interchangeable and compatible with each other.

SPECIFICATIONS

Specifications are subject to change without notice for further improvement.
Weight and dimensions shown are approximate.

■ Turntable section

Type:	Quartz direct drive
Features:	Automatic turntable Auto start Auto return Auto stop Repeat play Manual play
Drive method:	Direct drive
Motor:	Brushless DC motor
Drive control method:	Quartz-phase-locked control
Turntable platter:	Aluminum die-cast Diameter 31.2 cm (12-9/32")
Turntable speeds:	33-1/3 rpm and 45 rpm
Wow and flutter:	0.012% WRMS* 0.025% WRMS (JIS C5521) ±0.035% peak (IEC 98A Weighted)

*This rating refers to turntable assembly alone, excluding effects of record, cartridge or tonearm, but including platter. Measured by obtaining signal from built-in frequency generator of motor assembly.

Rumble:	–56 dB (IEC 98A Unweighted) –78 dB (IEC 98A Weighted)

■ Tonearm section

Type:	Statically balanced straight tonearm Plug-in connector cartridge system
Effective length:	230 mm (9-1/16")
Overhang:	15 mm (19/32")
Tracking error angle:	Within 2°32′ at the outer groove of 30 cm (12") record Within 0°32′ at the inner groove of 30 cm (12") record
Effective mass:	7.5 g (without cartridge) 13.5 g (including cartridge)
Stylus pressure adjustment range:	1.25±0.25 g
Applicable cartridge weight:	6 g
Phono cable capacitance:	90 pF

■ General

Power supply:	120 V AC, 60 Hz
Power consumption:	6W
Dimensions: (W×H×D)	43×10×37.5 cm (16-15/16"×3-15/16"×14-3/4") Maximum height when dust cover is open. 43×37×41 cm (16-15/16"×14-9/16"×16-1/8")
Weight:	4.6 kg (10.1 lb.)

Technics

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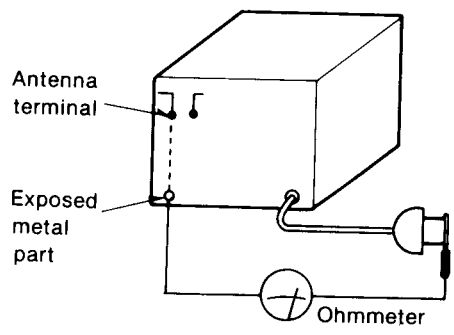
■ SAFETY PRECAUTION (This "safety precaution" is applied only in U.S.A.)

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• INSULATION RESISTANCE TEST

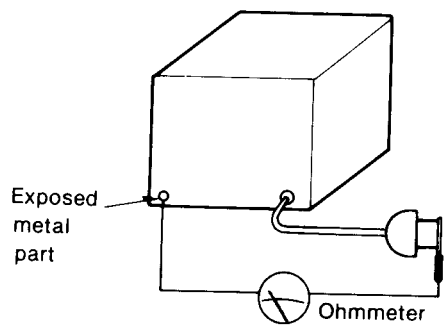
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = 3MΩ—5.2MΩ

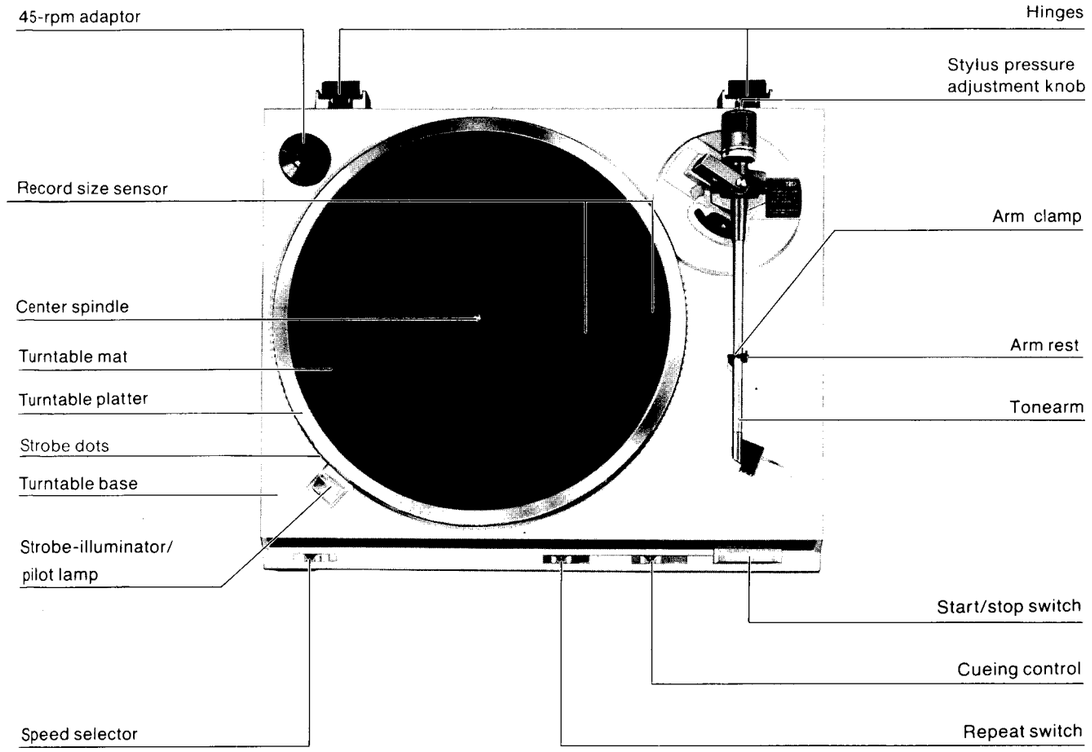


(Fig. B)

Resistance = Approx ∞

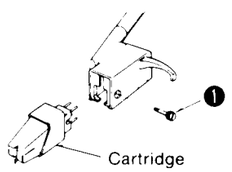
4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

■ LOCATION OF CONTROLS

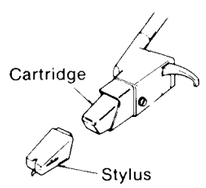


■ DISASSEMBLY INSTRUCTIONS

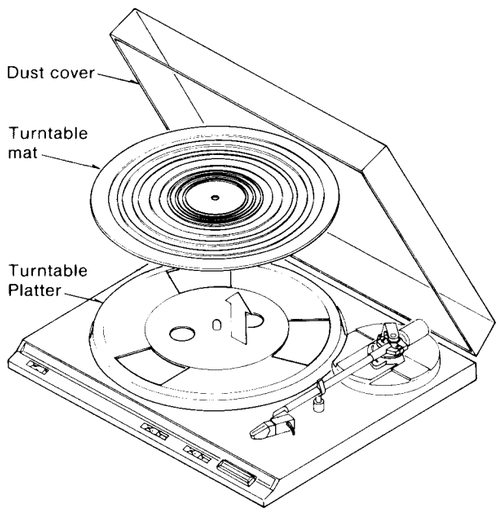
Ref. No 1	How to remove the cartridge
Procedure 1	1. Remove the setscrew ❶. 2. Pull out the cartridge, taking care that your hand does not touch the stylus tip.



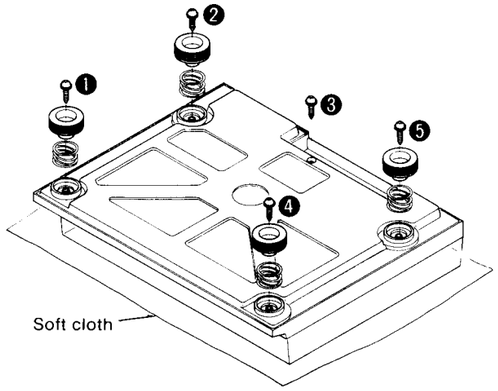
Ref. No 2	How to remove the stylus
Procedure 2	• Pull out the stylus, taking care not to touch the stylus tip.



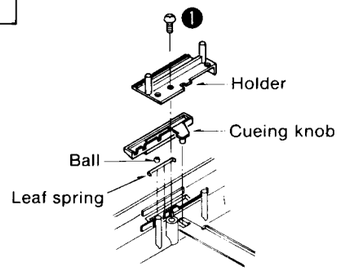
Ref. No 3	How to remove the turntable platter
Procedure 3	1. Open the dust cover and remove the turntable mat. 2. Lift up the turntable platter.



Ref. No 4	How to remove the bottom board
Procedure 3 ➧ 4	1. Turn over the unit on a soft cloth. 2. Remove the 5 setscrews (❶ ~ ❺)

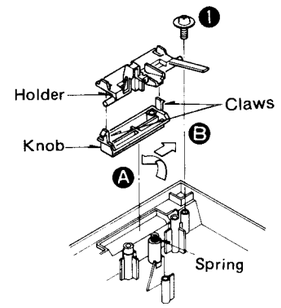


Ref. No 5	How to remove the cueing knob
Procedure 3 ➧ 4 ➧ 5	• Remove the setscrew ❶



Caution:
When removing the cueing knob, please note the ball bearing which is held between the leaf spring and knob and take care not to drop or lose it.

Ref. No 6	How to remove the stop knob
Procedure 3 ➧ 4 ➧ 6	1. Remove the setscrew ❶. 2. Remove the holder (with knob) in the direction of the arrows (Ⓐ, Ⓑ). 3. Release the 2 claws.

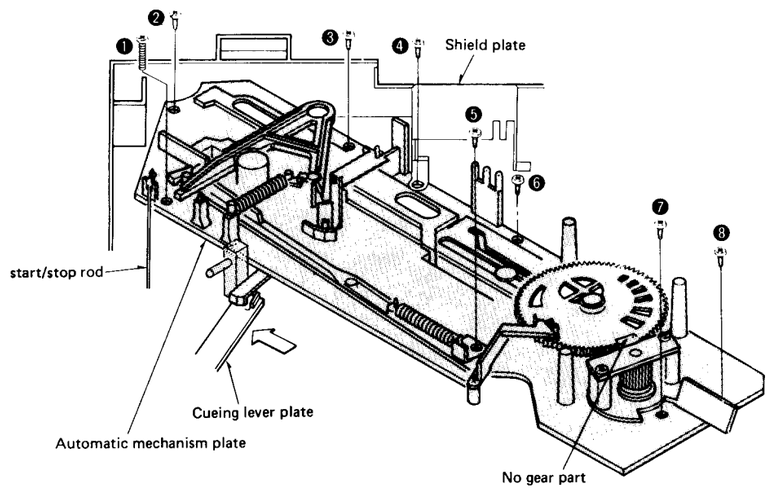


Note: When attaching the stop knob, do not for get to attach the spring.

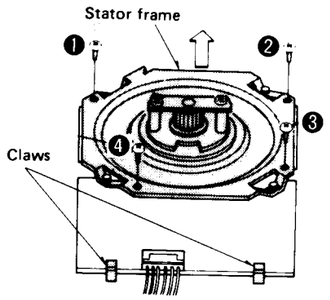
Ref. No. 7	How to remove the automatic mechanism plate
Procedure 3 ➧ 4 ➧ 7	1. Move the cueing control knob to "cueing down" position. 2. Release the start/stop rod. 3. Remove the 8 setscrews. (❶ ~ ❽). 4. Lift up the automatic mechanism plate.

Note:
When fitting the automatic mechanism plate, check the following points.

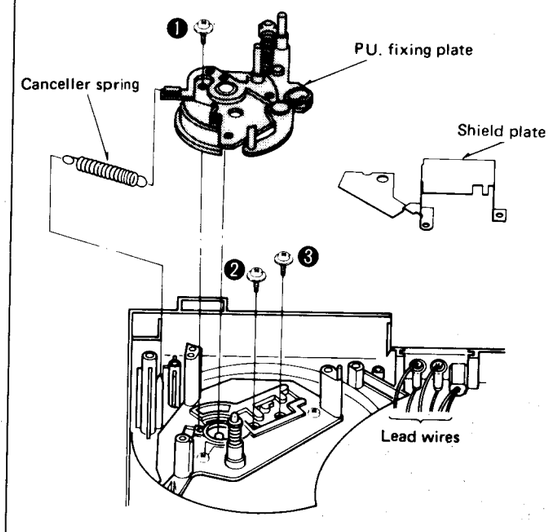
- Turn the main gear unitil it comes to the no gear part.
- Shift the cueing lever plate in the direction of the arrow.



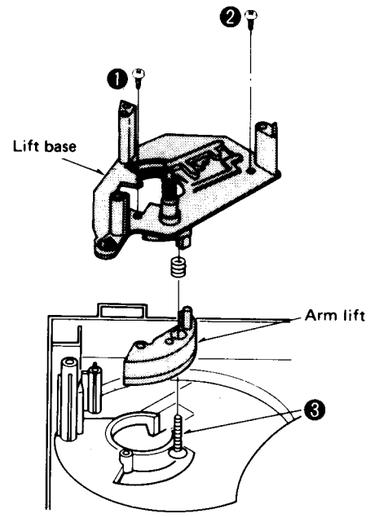
Ref. No. 8	How to remove the stator frame
Procedure 3 ♦ 4 ♦ 7 ♦ 8	1. Remove the 4 setscrews. (❶ ~ ❹). 2. Remove the stator frame from the 2 claws in the direction of the arrow.



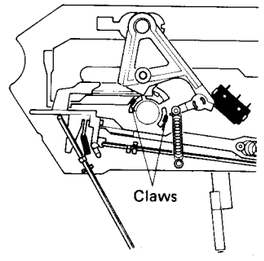
Ref. No. 9	How to remove the tonearm
Procedure 3 ♦ 4 ♦ 7 ♦ 9	1. Remove the PU fixing plate setscrew ❶. 2. Remove the shield plate. 3. Unsolder the 5 lead wires of the phono terminal. 4. Remove the 2 setscrews. (❷, ❸). ★ PU lead wiring method. White . . . . . .L channel (+) terminal Blue . . . . . .L channel (–) terminal Red . . . . . .R channel (+) terminal Green . . . . . .R channel (–) terminal Black . . . . . .Ground terminal



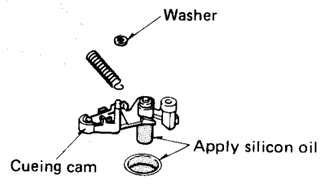
Ref. No. 10	How to remove the lift base and lift
Procedure 3 ♦ 4 ♦ 7 ♦ 9 ♦ 10	1. Remove the 2 setscrews. (❶, ❷). Then the lift base can be removed. 2. To remove the arm lift, remove the screw ❸.



Ref. No. 11	How to remove the cueing cam
Procedure 3 ♦ 4 ♦ 7 ♦ 11	• Release the 2 claws with a driver.



1. Remove the washer.
2. Pull out the cueing cam.

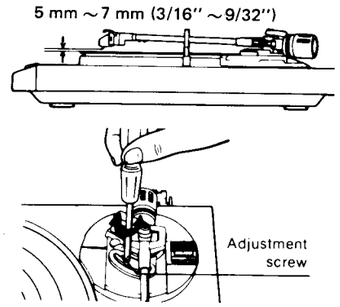


Note:
If the cueing time of the tonearm becomes too short, or if the cueing cam is replaced, apply silicon oil (Part No. SZZ0L12) according to the following procedure.
1. Remove the cueing cam.
2. Apply silicon oil to the cueing cam and oil tank.

■ MEASUREMENTS AND ADJUSTMENT

1. Arm-lift height

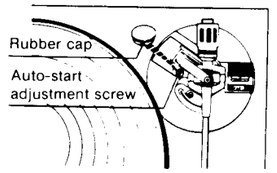
The arm-lift height (distance between the stylus tip and the record surface when the cueing control is at the " ▼ " position) has been adjusted at the factory to aproximately 5 to 7 mm (3/16" ~ 9/32").
If the clearance is too narrow or too wide, turn the adjustment screw clockwise or counterclockwise.
Clockwise rotation
– distance between the record and stylus tip is decreased.
Counterclockwise rotation
– distance between the record and stylus tip is increased.



2. Adjustment of automatic start position

If the stylus does not land in the lead-in groove, adjust as follows.
1. Clamp the tonearm to the arm rest.
2. Remove the rubber cap.
3. Turn the screw with a screwdriver, clockwise or counterclockwise as necessary.

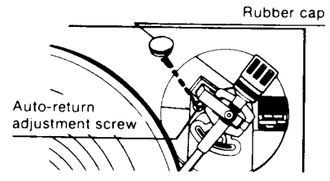
If the stylus tip sets down too far in the recorded groove.
–turn counterclockwise.
If the stylus tip sets down outside of the record.
–turn clockwise.
Adjust so the stylus tip lands 1 ~ 2 mm in from the edge of the record.



3. Automatic return position

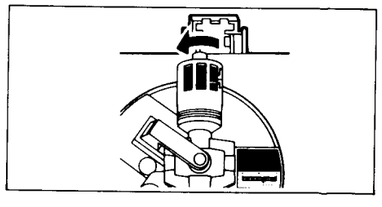
(Remove the rubber cap.)
1. Put the stylus protector on the cartridge.
2. Move the tonearm toward the center of the record.
   The auto-return adjustment screw will appear.

If the tonearm tends to return to the arm reset before the play has finished.
– turn counterclockwise.
If the tonearm fails to return after the final groove.
– turn clockwise.



■ ABOUT STYLUS PRESSURE (TRACKING FORCE)

The tracking force is already set to 1.25 g so no adjustment is necessary. When records with a high modulation level are played or when the turntable is used where the temperature is low or in a location subject to vibrations, sound may be distorted and the stylus may skip. If this occurs, rotate the stylus-pressure adjustment knob at the rear to the "1.5" setting.
If the knob is set to "1.0" the tracking force will be lighter.



■ TROUBLESHOOTING

Turntable does not rotate

- AC voltage of FC3 terminal (AC18V) — NO → T1, AC cord
- YES
- DC voltage of regulator IC (IC1)
  ① 22V, ② 0V, ③ 12V — NO → D1 ~ D4, C4, IC1
- YES
- **Power supply input terminal**
  DC voltage of drive and control IC's
  IC101 ① pin 12V
  IC201 ⑱ pin 8.5V — NO → IC101, IC201, R204, R208, S2
- YES
- **Brake circuit**
  DC voltage of IC201 pin ⑫ . . . . 0.6V — NO → IC201, IC101, C107
- YES
- **Drive coil and Hall element**
  1. Conduction check of drive coils (A1 ~ A4) ※1
  2. DC voltage of Hall elements (H101, H102)

	1	2	3	4
Voltage	3.8	7.6	3.8	0

  — NO → Drive coil, H101, H102, IC101
- YES
- **Drive circuit**
  1. DC voltage at each pin of drive IC (IC101)

	2	3	8	10	11
Voltage	0.6	12	0	4.9	4.7

  2. Waveform between pins ④ and ⑤ (⑥and ⑦) of drive IC

  33rpm. . . . . 303ms — NO → IC101

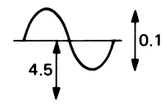
Speed cannot be changed

- **Speed selector circuit**
  DC voltage of pin ⑨ of control IC (IC201)
  33rpm 0V
  45rpm . . . . . 5.3V — NO → S2, IC201

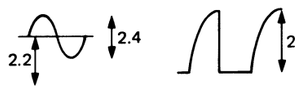
※1
1 When the voltage at pins ① and ③ is about 1/2 of the voltage at pin ②, the Hall element is normal.
2 If the voltage is abnormal, unsolder the pins ① and ③, and check the voltage again. (When it is 1/2 of the voltage at pin ②, the Hall element is normal but drive IC is defective.)
3 If one Hall element is defective, the rotation is turntable position cannot be detected.

Unsatable rotation

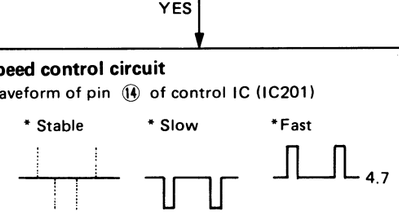
- **FG amplifier circuit**
  1. Conduction check of FG coil.
  2. Waveform of pin ⑮ of control IC (IC201)



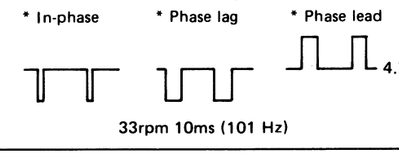
  33rpm 20ms, 45rpm 14ms — NO → FG coil, IC201, C201 ~ C203, R203, R205
- YES
- **Quartz oscillator circuit**
  Waveforms of pins ③ and ④ of control IC (IC201)



  ③ pin 0.24μs, ④ pin 1.9μs — NO → X201, IC201, C204 ~ C206
- YES
- **Speed control circuit**
  Waveform of pin ⑭ of control IC (IC201)



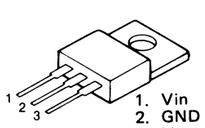
  33rpm 20ms (50.5 Hz) — NO → IC201, IC101
- YES
- **Phase control circuit**
  Waveform of pin ⑬ of control IC (IC201)



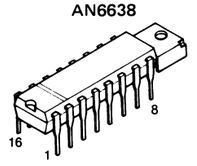
  33rpm 10ms (101 Hz) — NO → IC201, IC101

• Terminal guide of IC's, Transistor and diodes

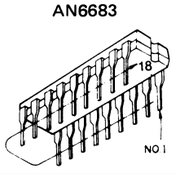
AN78M12



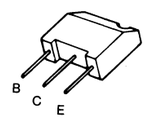
AN6638



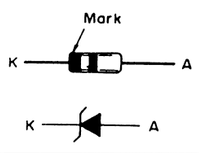
AN6683



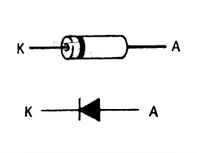
2SD636



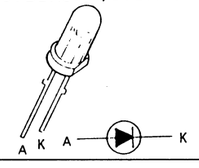
MA4075



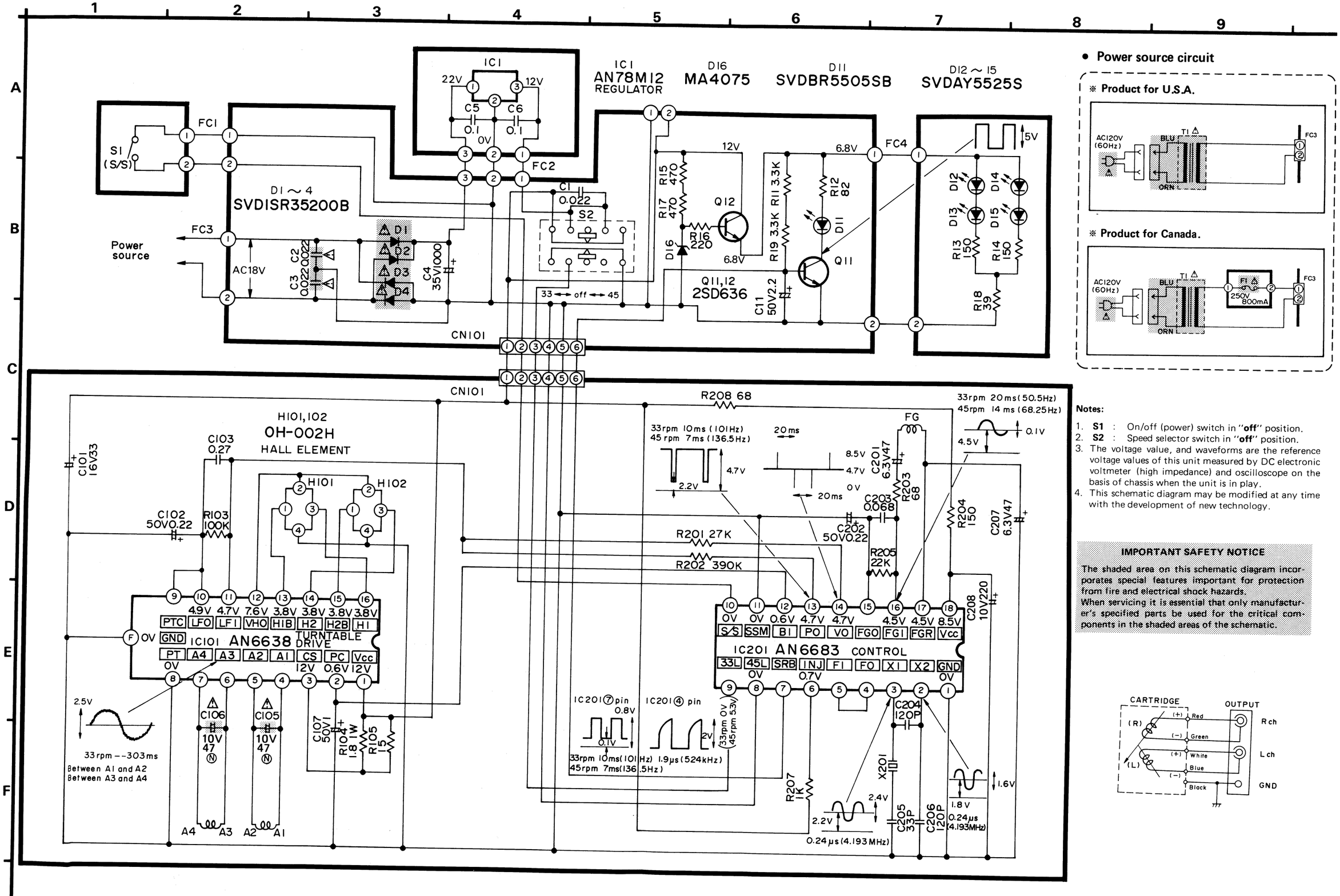
SVD1SR35200V



SVDBR5505, SVDAY5525



■ SCHEMATIC DIAGRAM



- **Power source circuit**

※ **Product for U.S.A.**

※ **Product for Canada.**

Notes:

1. **S1** : On/off (power) switch in "**off**" position.
2. **S2** : Speed selector switch in "**off**" position.
3. The voltage value, and waveforms are the reference voltage values of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis when the unit is in play.
4. This schematic diagram may be modified at any time with the development of new technology.

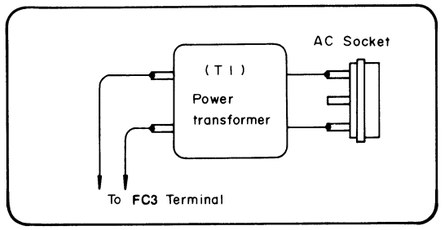
IMPORTANT SAFETY NOTICE

The shaded area on this schematic diagram incorporates special features important for protection from fire and electrical shock hazards.
When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

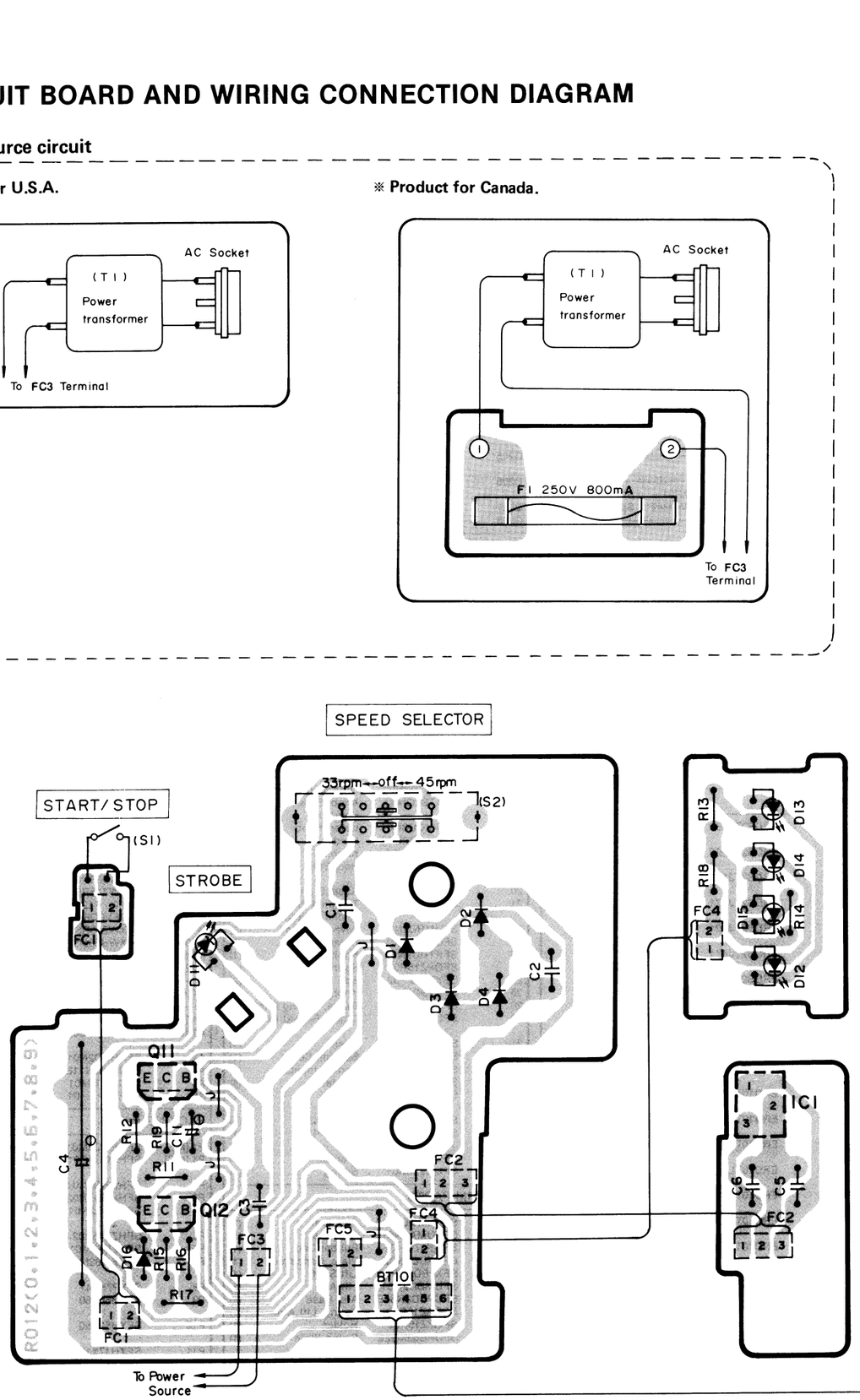
■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

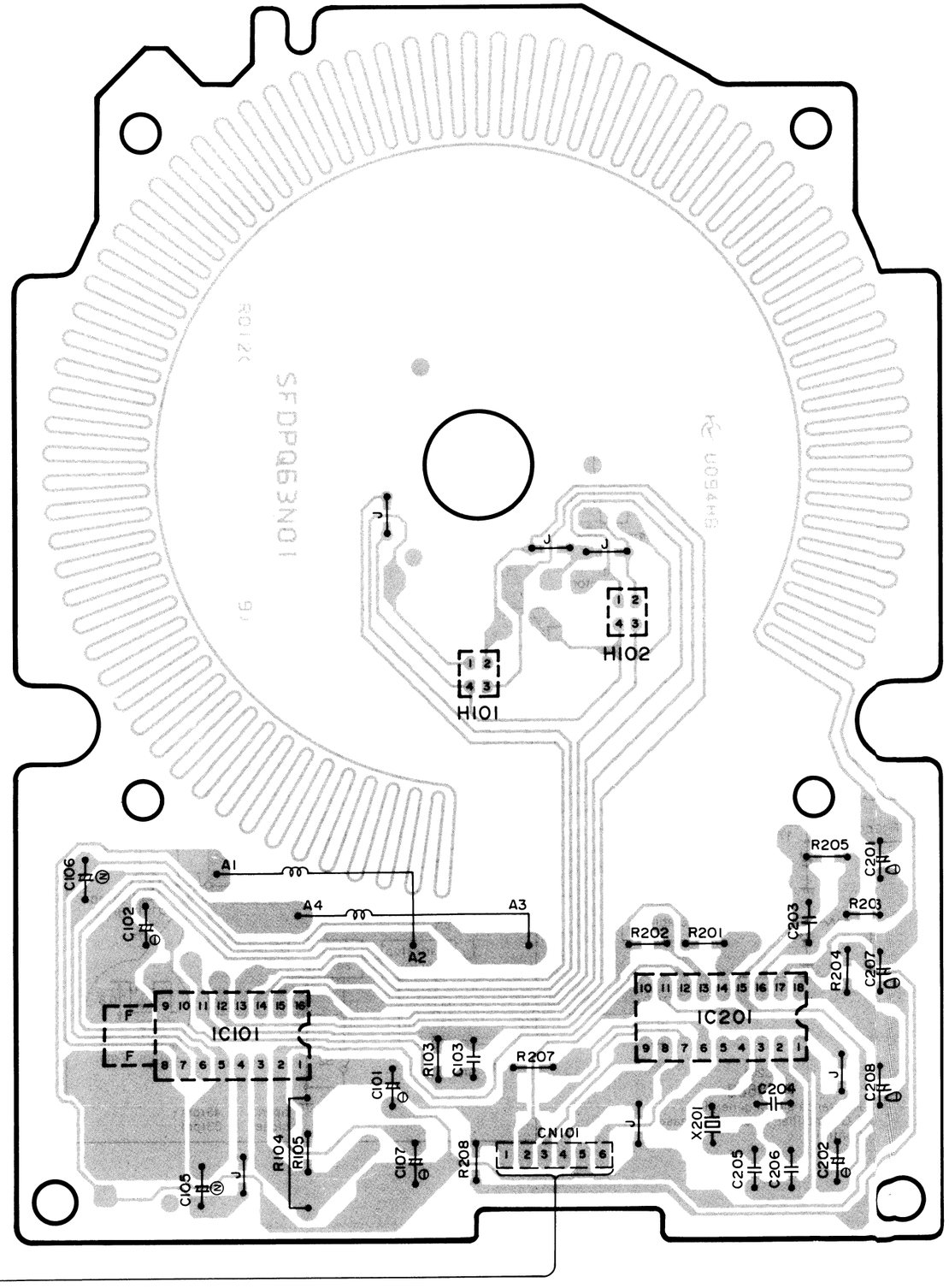
- **Power source circuit**

※ Product for U.S.A.

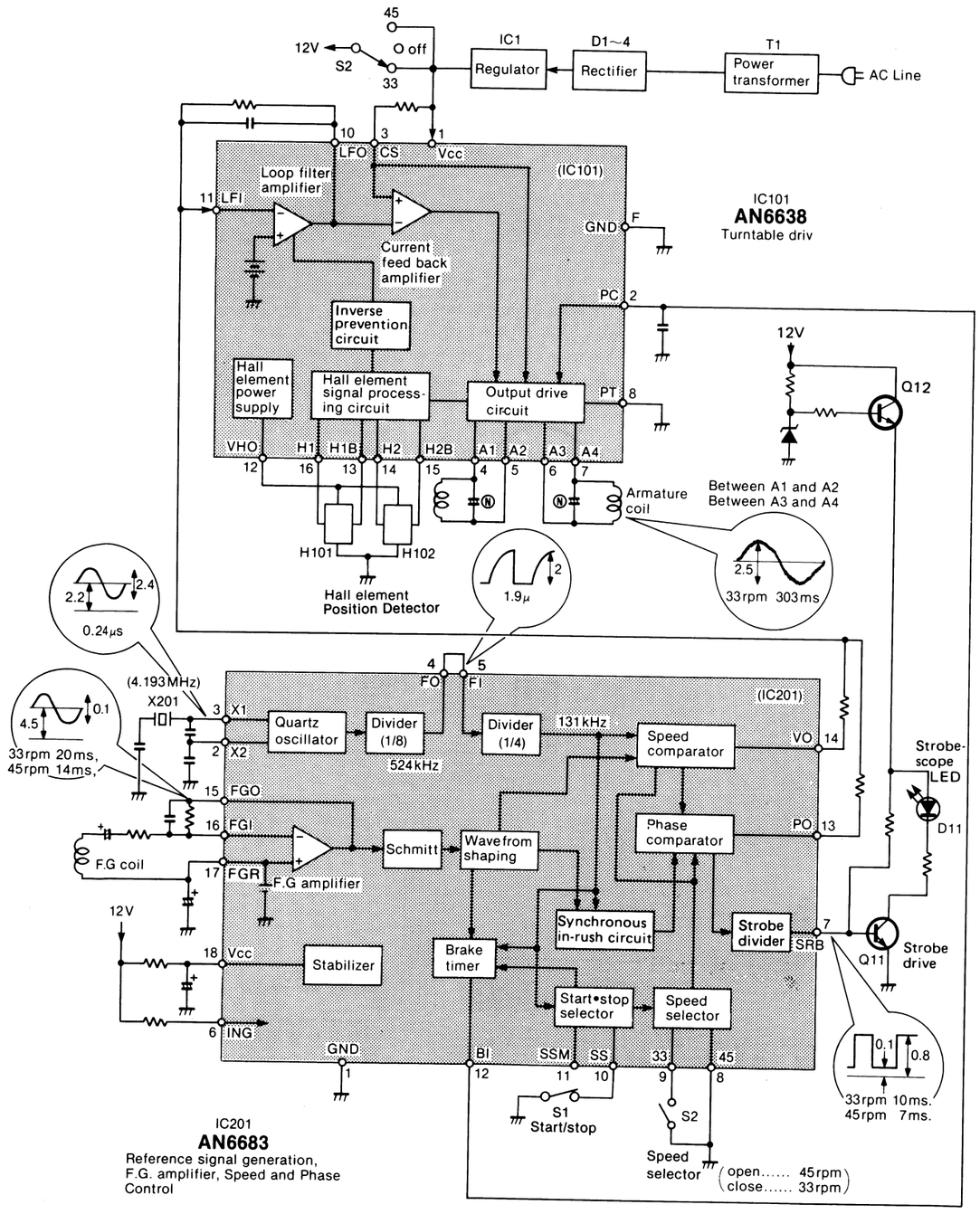


※ Product for Canada.





■ BLOCK DIAGRAM



■ REPLACEMENT PARTS LIST

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

Area [M] .....U.S.A. [MC] ...Canada.

3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
4. The "Ⓢ" mark is service standard parts and may differ from production parts.
5. The parenthesized numbers in the column of description stand for the quantity per set.

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1	AN78M12	Regulator
IC101	AN6638	Drive
IC201	AN6683N	Control
TRANSISTORS		
Q11, 12	2SD636	Strobe Drive
DIODES		
D1~4 ⚠	SVD1SR35200V	Rectifier
D11	SVDBR5505SB	Strobe
D12~15	SVDAY5525S	Quarts Indication
D16	MA4075	Zener, 7.5V
SWITCHES		
S1	SFDSD72R01	Start/Stop
S2	SFDSHSW0949	Speed Selector
HALL ELEMENTS		
H101, 102	0H−002	Turntable Position Detector
POWER TRANSFORMERS		
T1 [M] ⚠	SLT48DTL3A	Power Source
T1 [MC] ⚠	SLT48DT11C	Power Source
CRYSTAL		
X201	SVQSH41TR	4.193MHz
FUSE		
F1 [MC] only ⚠	XBA2F08NU100	250V, 800mA

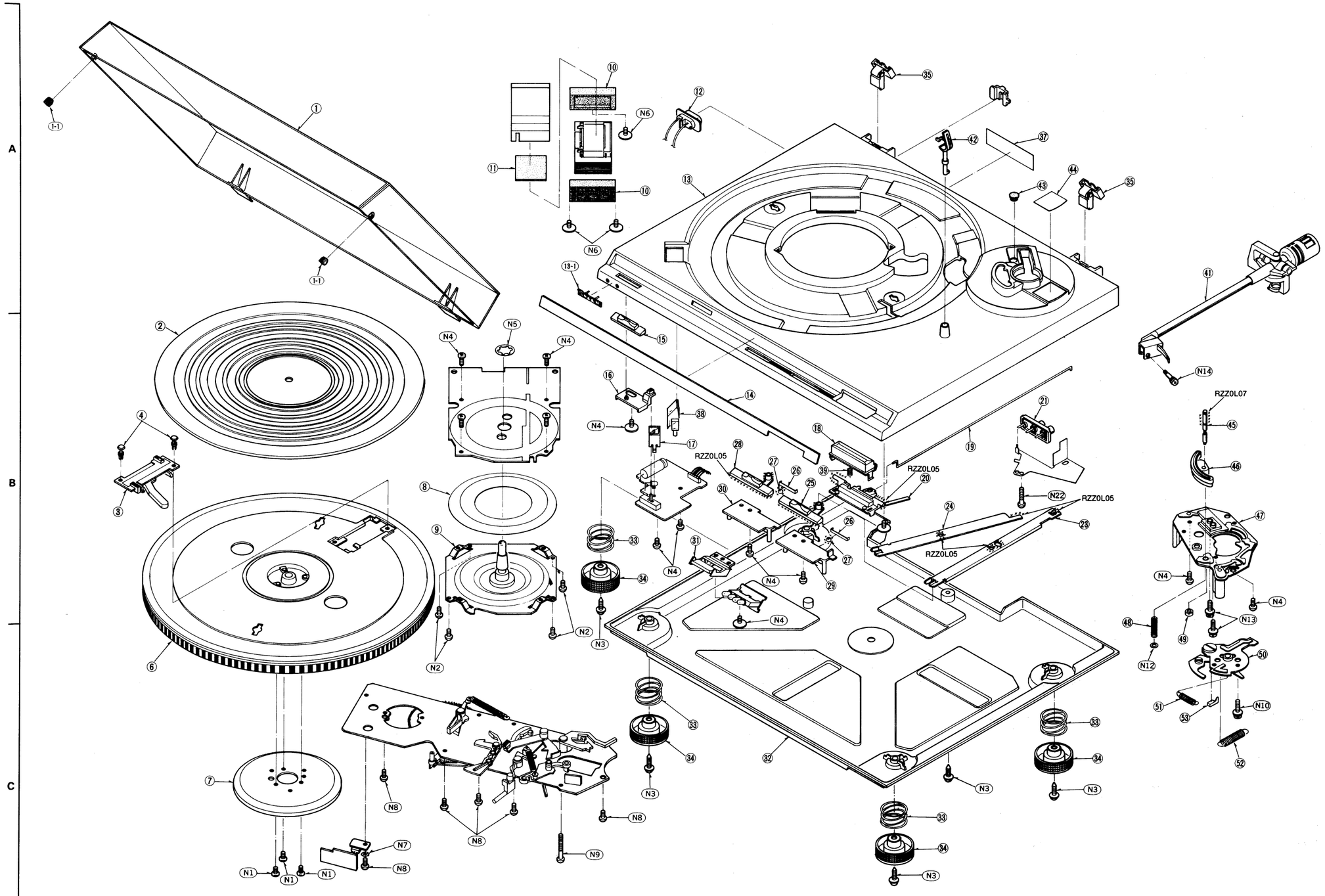
Ref. No.	Part No.	Description
RESISTORS		
R11	ERDS2TJ332	Carbon, 1/4W, 3.3KΩ, ±5%
R12	ERDS2TJ820	Carbon, 1/4W, 82Ω, ±5%
R13, 14	ERDS2TJ151	Carbon, 1/4W, 150Ω, ±5%
R15	ERDS2TJ471	Carbon, 1/4W, 470Ω, ±5%
R16	ERDS2TJ221	Carbon, 1/4W, 220Ω, ±5%
R17	ERDS2TJ471	Carbon, 1/4W, 470Ω, ±5%
R18	ERDS2TJ390	Carbon, 1/4W, 39Ω, ±5%
R19	ERDS2TJ332	Carbon, 1/4W, 3.3KΩ, ±5%
R103	ERD10TLJ104U	Chip Carbon, 1/8W, 100KΩ, ±5%
R104	ERX1ANJ1R8	Metal Film, 1W, 1.8Ω, ±5%
R105	ERD10TLJ150U	Chip Carbon, 1/8W, 15Ω, ±5%
R201	ERD10TLJ273U	Chip Carbon, 1/8W, 27KΩ, ±5%
R202	ERD10TLJ394U	Chip Carbon, 1/8W, 390KΩ, ±5%
R203	ERD10TLJ680U	Chip Carbon 1/8W, 68Ω, ±5%
R204	ERD10TLJ151U	Chip Carbon, 1/8W, 150Ω, ±5%
R205	ERD10TLJ223U	Chip Carbon, 1/8W, 22KΩ, ±5%
R207	ERD10TLJ102U	Chip Carbon, 1/8W, 1KΩ, ±5%
R208	ERD10TLJ680U	Chip Carbon 1/8W, 68Ω, ±5%
CAPACITORS		
C1~3 ⚠	ECQG1223KZ	Polyester, 100V, 0.022μF, ±10%
C4	ECEB1VU102	Electrolytic, 35V, 1000μF
C5, 6	ECFR1H104ZF	Ceramic, 50V, 0.1μF, $\pm^{80}_{20}$%

Ref. No.	Part No.	Description
C11	ECEA1HU2R2B	Electrolytic, 50V, 2.2μF
C101	ECEA1CS330	Electrolytic, 16V, 33μF
C102	ECEA1HSR22B	Electrolytic, 50V, 0.22μF
C103	ECQV05274JZ	Polyester, 50V, 0.27μF, ±5%
C105, 106 ⚠	ECEA1AN470S	Non Polar Electrolytic, 10V, 47μF
C107	ECEA1HS010B	Electrolytic, 50V, 1μF
C201	ECEA0JS470B	Electrolytic, 6.3V, 47μF
C202	ECEA1HSR22B	Electrolytic, 50V, 0.22μF
C203	ECQM1H683KV	Polyester, 50V, 0.068μF, ±10%
C204	ECUV1H121JCM	Chip Ceramic, 50V, 120PF, ±5%
C205	ECUV1H330JCM	Chip Ceramic, 50V, 33PF, ±5%
C206	ECUV1H121JCM	Chip Ceramic, 50V, 120PF, ±5%
C207	ECEA0JS470B	Electrolytic, 6.3V, 47μF
C208	ECEA1AS221B	Electrolytic, 10V, 220μF
CABINET and CHASSIS PARTS		
1	SFADZ15R01E	Dust Cover (1)
1-1	SFGZD04N01	Rubber Cushion (2)
2	SFTGBD3N01	Turntable Mat (1)
3	SFUMQ34N01E	Base, Disc Size Sensor (1)
4	SFUZD33−01E	Latch, Disc Size Sensor (2)
6	SFTEQD3N01	Turntable Platter (1)
7	SFTMC07−01E	Magnet (1)
8	SFMGQ34N01	Cover, Stator Coil (1)
9	SFMZQ63M53A	Stator Flame Ass'y (1)
10	SFGCC05N02	Rubber Cushion (2)
11	SFGZC05N03	Rubber Cushion (1)
12 ⚠	SFDJHSC0491	AC Socket (1)
13	SFACQD3N01E	Cabinet (1)
13-1	SFKBBD2N01	Badge (1)
14	SFKKQD3N01	Ornament Plate (1)
15	SFKTBD2N03	Knob, Speed Selector (1)
16	SFUMQD3N01	Lever, Knob (1)
17	SFUMBD2N06	Holder (1)
18	SFKTBD2N01	Knob, Start, Stop (1)
19	SFUZB63M01	Rod, Start, Stop (1)
20	SFUMBD3N01	Base, Start, Knob (1)
21	SFDJBD2N01	Terminal Plate, Phono Output (1)
23	SFUMBD2N03	Lever, Cueing (1)
24	SFUPB63M01	Lever, Repeat (1)
25	SFKTBD2N02	Knob, Cueing (1)
26	SFQPZ15R02	Spring (2)
27	SFYB−5−32	Ball (2)
28	SFKTBD2N02	Knob, Repeat (1)
29	SFUMBD3N02	Guide, Cueing Knob (1)
30	SFUMBD2N02	Guide, Repeat Knob (1)
31	SFUMC13N03	Prism (1)
32	SFAUBD2N01	Bottom, Cover (1)
33	SFQCQD3N01	Spring, Insulator (4)
34	SFGABD2N01	Insulator (4)
35	SFATZ15R01A	Hinge (2)
37 [M]	SFNNQD3M01	Name Plate (1)
37 [MC]	SFNNQD3C02	Name Plate (1)
38	SFUMBD2N07	Storobe (1)
39	SFQHZ15R01	Spring (1)
TONEARM PARTS		
41	SFPAMQD201A	Tonearm (1)
42	SFKUMA1N01E	Arm Rest (1)
43	SFGK170−01	Rubber Cap (1)
44	SFKKBD2N02	Plate, Canceller (1)
45	SFXJBD2N51	Lift Shaft (1)
46	SFUMBD2N51	Lift Arm (1)
47	SFUPBD3N51E	Arm Base (1)
48	SFQAZ15R53	Spring, Lift Arm (1)
49	SFGZZ15R02	Holder (1)
50	SFUPB63M52E	Fixing Plate (1)
51	SFQHB63M57	Spring, Canceller (1)
52	SFQHB63M56	Spring (1)
53	SFUMZ15R57	Spring Pin (1)

Ref. No.	Part No.	Description
AUTOMATIC MECHANISM PARTS		
61	SFUKB63M52E	Mechanism Plate (1)
62	SFUBB63M51E	Drive Plate (1)
62-1	SFUMB63M52	Repeat Plate (1)
62-2	SFQPB63M51	Spring (1)
62-3	SFUMB63M51	Plate (1)
63	SFUMB63M71E	Lever Switch Ass'y (1)
63-1	SFQHQD3N01	Spring (1)
64	SFUMB63M53E	Cut Lever Ass'y (1)
64-1	SFQHB63M51	Spring (1)
65	SFUMB63M54	Lever, Drive Operation (1)
66	SFUGB63M51E	Main Gear Ass'y (1)
67	SFUMB63M65	Control Plate (1)
68	SFUMB63M64E	Plate (B) Ass'y Index (1)
69	SFUMB63M63	Plate (A), Index (1)
70	SFQPB63M53	Spring, Index Sub Plate (1)
71	SFUMB63M62	Sub Plate, Index (1)
72	SFUMB63M59	Lever, Cueing (1)
73	SFUMB63M60	Cam, Cueing (1)
74	SFQPB63M52	Spring, Cueing Cam (1)
75	SFQPB63M54	Spring, Cueing Cam (1)
76	SFUMB63M61	Lever, Brake (1)
77	SFQSB63M52	Spring, Brake (1)
78	SFUZB63M52	Felt, Brake Lever (1)
79	SFQHB63M55	Spring, Cueing Cam (1)
80	SFUMB63M58	Lever, Repeat (1)
81	SFQHB63M54	Spring, Repeat Lever (1)
82	SFUMQ63M51E	Record Size Detector Ass'y (1)
82-1	SFQHB63M53	Spring, Record Size Detector Ass'y (1)
83	SFUMZ15R56	Pin (7)
84	SFQSB63M51	Rod (1)
SCREWS and WASHERS		
N1	XTN3+6J	Screw, ⊕3×6 (3)
N2	XTV3+6J	Screw, ⊕3×6 (4)
N3	XTW3+14QFYR	Screw, ⊕3×14 (4)
N4	XTV3+8G	Screw, ⊕3×8 (10)
N5	SFXWC06N02	Washer (1)
N6	SFXGQ06N01	Screw (4)
N7	XWC3B	Washer, φ3 (1)
N8	XTV3+10G	Screw, ⊕3×10 (6)
N9	XTV3+30J	Screw, ⊕3×30 (1)
N10	SFXGQ34N02	Screw (1)
N12	SFXWZ15R51	Washer (1)
N13	XYN3+F12	Screw, ⊕3×12 (2)
N14	SFPEV0Q601	Screw, Cartridge (1)
N16	SFXWZ15R51	Washer (9)
N20	SFXWB63M52	Washer (1)
N21	SFXWB63M53	Washer (1)
N22	XTV3+20J	Screw, ⊕3×20 (1)
ACCESSORIES		
A1 [M]	SFNUQD3M01	Instruction Book (1)
A1 [MC]	SFNUQD3C01E	Instruction Book (1)
A2	SFDHBD2N01	Phono Cord (1)
A3	SFDLJ02N11E	Ground Wire (1)
A4 ⚠	SFDAC05M01	AC Cord (1)
A5	SFWE212−01	45 Adaptor (1)
PACKING PARTS		
P1 [M]	SFHPQD3M01	Carton Box (1)
P1 [MC]	SFHPQD3C01	Carton Box (1)
P2	SFHHBD3N01	Pad (Left) (1)
P3	SFHHBD3N02	Pad (Right) (1)
P4	SFHZBD2N01	Clamper, Tonearm Weight (1)
P5	SFHZZ15R02	Clamper, Cord (1)
P6	SFHZB63M01	Clamper, Tonearm (1)
P7	SFHKB63M01	Clamper, Turntable Platter (2)
P8	SFYP75A41	Sheet (1)
P9	SFYH60X60	Polyethylene Bag Unit (1)
P10	SFYH52X50	Polyethylene Bag Dust Cover (1)
P11	SFYH17X16	Polyethylene Bag Cord (1)
P12	SFYF32A35	Polyethylene Bag Turntable Mat (1)
P13	SFHDBD2N01	Pad, Turntable Mat (1)

■ EXPLODED VIEW

- **Cabinet and chassis parts**



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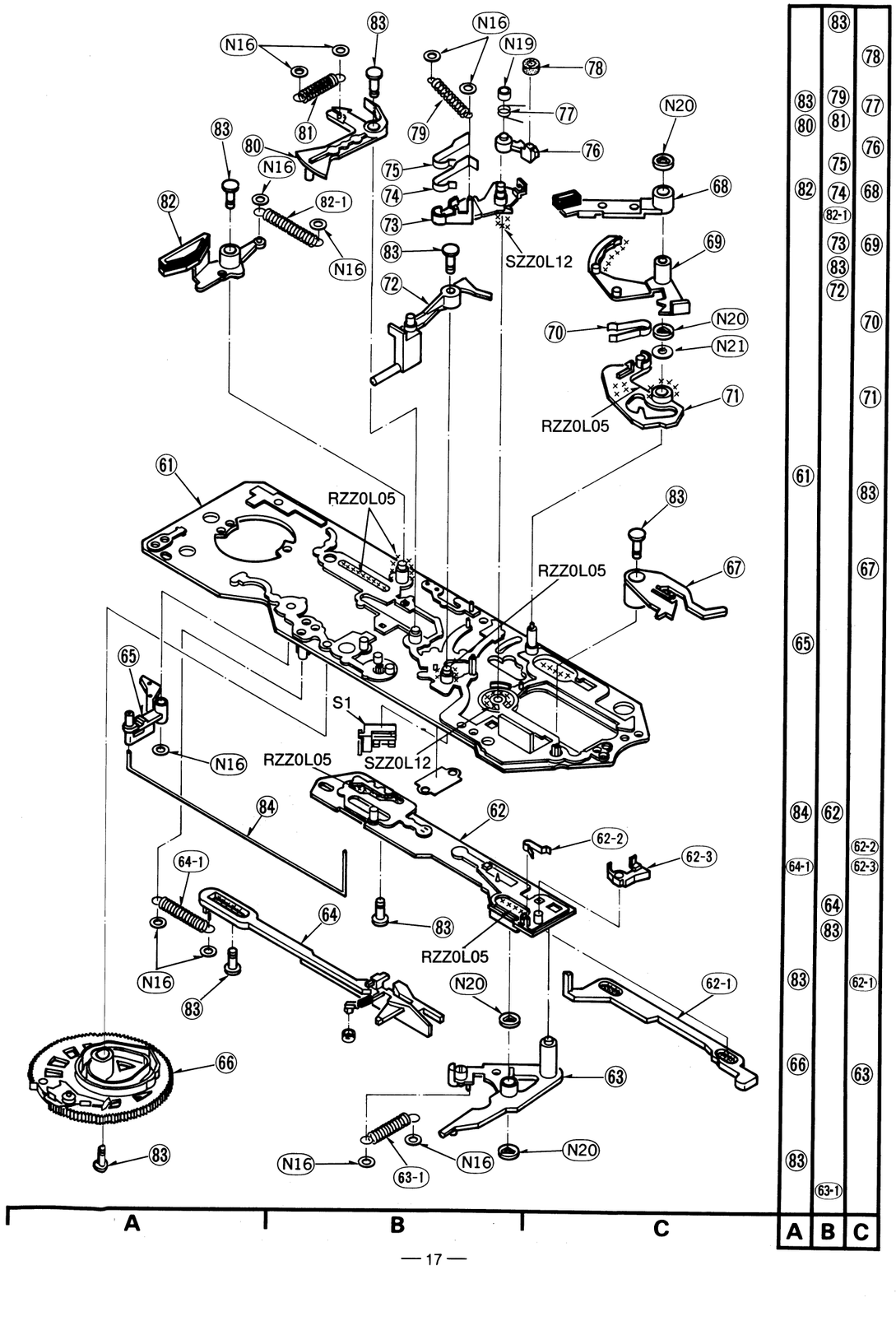
• **Automatic mechanism plate parts**



■ OPERATIONAL DESCRIPTION OF MECHANISM

• **Auto mechanism timing chart**

No.	Operation	Description	Rotation angle of main gear	Fig. No.
1.	**Start** (Press the start/stop button.)	•Start/stop rod pushes the cut-lever to disengage it from the drive plate.	0°	Fig. 1 ⓘ, ⓙ
	(Drive circuit turns ON.)	•Portion Ⓐ of cut-lever pushes the switch lever. •Switch lever turns and presses the power switch contact.	0°	Fig. 1 ⓘ
	(Main gear rotates.)	•Portion Ⓑ of cut-lever pushes the actuating rod. •Actuating lever turns and pushes the friction link and actuating link. •Small gear and main gear are engaged.	0°	Fig. 1 ⓚ ~ ⓛ
2.	**Cueing up**	•As the main gear rotates, the drive plate moves. •Projection Ⓒ of the drive plate pushes the cueing cam. •Cueing cam rotates.	6° ~ 33°	Fig. 1 ⓜ, ⓝ Fig. 2 ⓐ
3.	**Movable piece setting**	•Movable piece touches the switch control piece. •Movable piece is turned to hold the PU fixing plate moving pin.	152°	Fig. 3 ⓐ
4.	**Record size detection plate setting**	•Record size detection plate rotates when the drive plate moves.	156°	Fig. 2 ⓑ
5.	**Index setting**	•Index plates (A) and (B) and index sub-plate rotates when the drive plate moves.	158°30′	Fig. 2 ⓒ
6.	**Record size detection**	★ Detection of 30 cm (12") record 1. The record size detecting plate pushes the reset lever attached to the turntable platter. 2. Only the 30 cm record detecting pin interlocked with the reset lever moves down. 3. The 30 cm record detecting pin touches index plate (B), then index plates (A) and (B) rotate.	170° ~ 238°	Fig. 4 ⓔ
		★ Detection of 17 cm (7") record 1. The record size detecting plate pushes the reset lever attached to the turntable platter. 2. Both 30 cm and 17 cm record detecting pins interlocked with the reset lever move down. 3. The 30 cm and 17 cm record detecting pins touch index plate (B), then index plates (A) and (B) rotate.	170° ~ 238°	Fig. 5 ⓕ
		★ In case of no record 1. The record size detecting plate pushes the reset lever attached to the turntable platter. 2. Both 30 cm and 17 cm record detecting pins interlocked with the reset lever remain up. 3. The 30 cm and 17 cm record detecting pins do not touch index plate (B), so index plates (A) and (B) as well as index sub-plate remain stationary.	170° ~ 238°	Fig. 4
7.	**Positioning of index plate**	•When the main gear rotates, the drive plate starts moving in the direction of arrow ⓮. •Index plates (A), (B) and index sub-plate move back slightly as in the record size detection mode.	255° ~ 278°30′	Fig. 2 ⓰, ⓱
8.	**Tonearm drop position**	•PU fixing plate moving pin turns the PU fixing plate, pushing it in the direction of arrow ⓲. ★ In case of 30 cm record The PU fixing plate rotates until drop positioning pin (A) contacts index plate (A). ★ In case of 17 cm record The PU fixing plate rotates until drop positioning pin (A) contacts index plate (A). ★ In case of no record The PU fixing plate does not rotate since drop positioning pin (B) is touching index plate (A).	 269° ~ 299° 269° ~ 317°	Fig. 6 Fig. 6 Fig. 7 Fig. 8
9.	**Power switch lock**	•The PU fixing plate rotates and the PU fixing plate pin pushes the switch control piece in the direction of arrow ⓴. •When the PU fixing plate pin moves to point ㉑, the switch control piece moves in the direction of arrow ㉒, and then the projection of the switch control piece is held by the mechanism board.	269° ~ 299°	Fig. 1 ⓴ ~ ㉒

No.	Operation	Description	Rotation angle of main gear	Fig. No.
10.	**Moving piece reversal**	•Actuating piece attached to the drive plate touches the mechanism board and is reversed, making the PU fixing plate moving pin free.	310° ~ 326°	Fig. 3 ㉓
11.	**Cueing down**	•Projection Ⓒ of the drive plate is disengaged from the cueing cam, thereby shifting for cueing down.	336° ~ 354°40′	Fig. 2 ㉔
12.	**Index cancel**	•Also, when the drive board moves, the index plate returns to the initial condition.	340° ~ 360°	Fig. 2 ㉕
13.	**Begin play**	•The main gear and small gear disengage; only the small gear continues to rotate (turntable rotation).	360°	
14.	**End play**	•The tonearm moves to the center of the turntable. •The PU fixing plate pushes the actuating rod. •Operation continues as in No. 1 Start.		Fig. 1 ❹ ~ ❼
15.	**Cueing up**	•(Same as No. 2 Cueing up)	6° ~ 33°	
16.	**Tonearm return**	•The drive board pushes the PU fixing plate moving pin; the tonearm returns to the arm rest.	43° ~ 142°	
17.	**Cueing down**	•(Same as No. 11 Cueing down)	336° ~ 354°40′	
18.	**Power off**	•The fixed pin of the PU fixing plate contacts the switch control piece; the projection of the switch control piece breaks contact with the mechanism board. The switch lever rotates, causing the power switch contact to disengage.	351°30′	

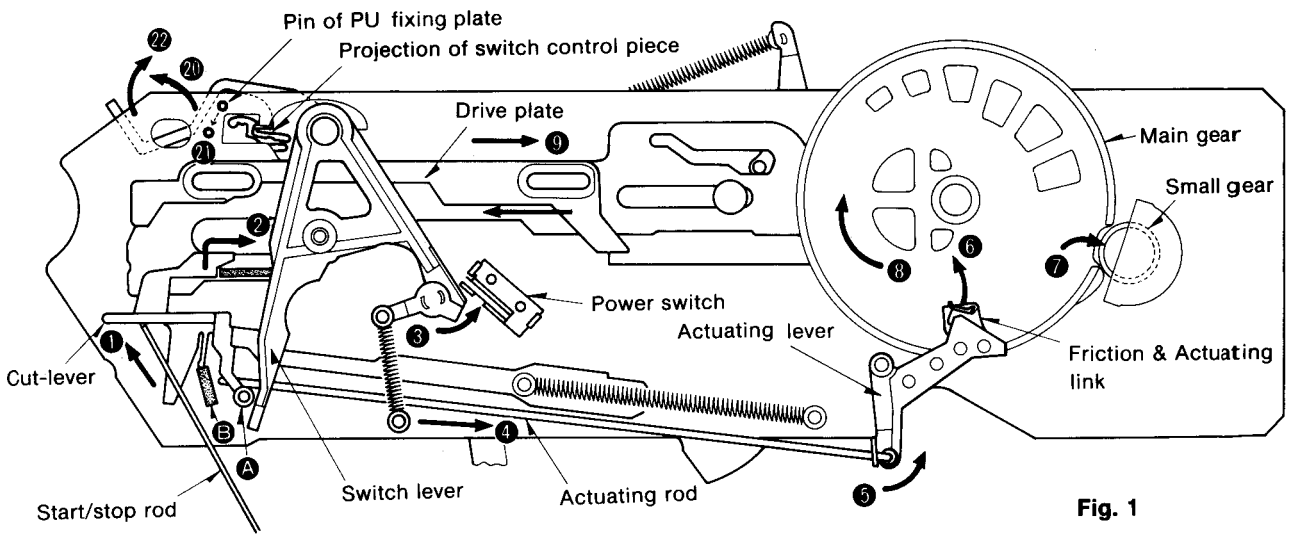


Fig. 1

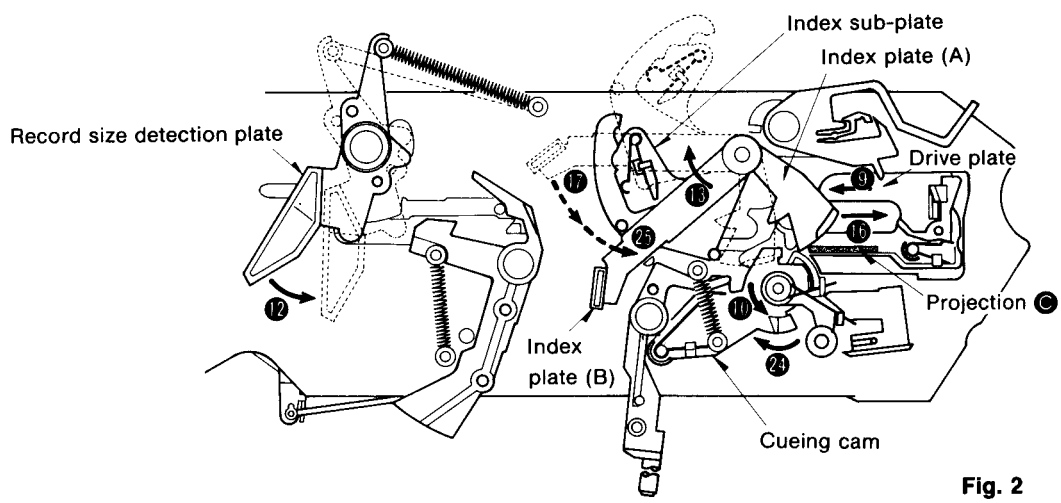


Fig. 2

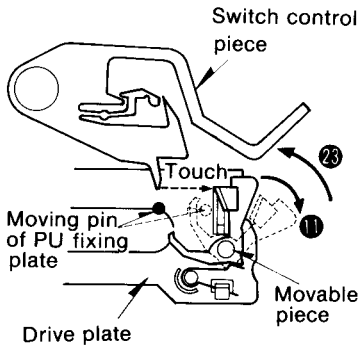


Fig. 3

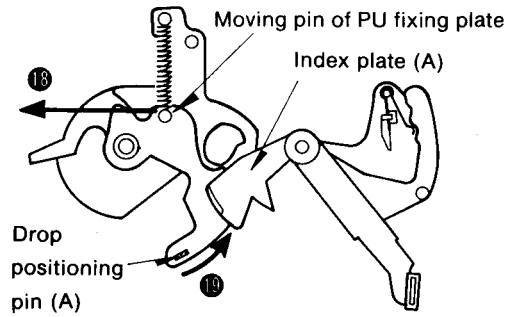


Fig. 6

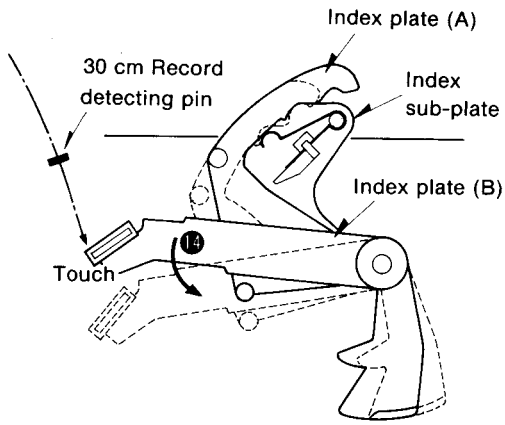


Fig. 4

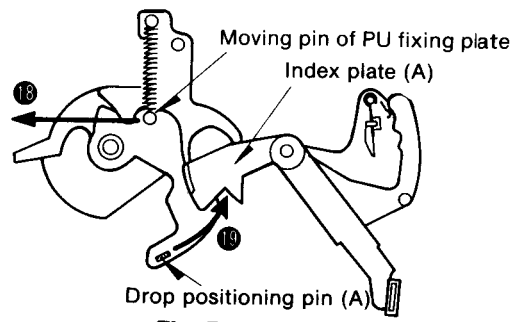


Fig. 7

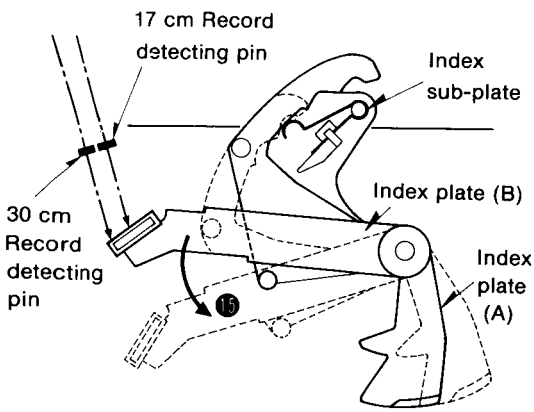


Fig. 5

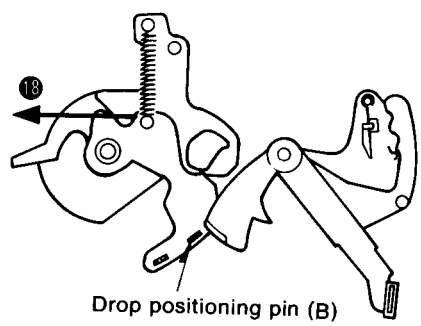


Fig. 8

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